



# The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 116, No. 21

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CHICAGO, ILLINOIS

MAY 24, 1941

## ACTIVE IMMUNIZATION AGAINST TETANUS AND DIPHTHERIA IN INFANTS AND CHILDREN

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Prevention of certain infectious diseases by immunization has become an established part of medical practice. Active immunity produced by the introduction of an organism or its products into the body predisposes to the more rapid development of the formation of antibodies on subsequent exposure to that particular antigen. This is preferable to passive immunity because of its long duration and because usually no animal serum is used to which the recipient might be sensitive or sensitized. Passive immunity, although highly effective, has definite limitations because of its nature. It is of temporary duration, it must be given at the proper time or interval, it usually sensitizes the recipient to the serum of the animal from which it is derived or the recipient may already be an allergic person.

Active immunization of infants and children against diphtheria is now generally performed. The practical value of this procedure is so well known that further discussion is not necessary.

Although the incidence of tetanus has steadily declined, there are many reasons why active immunization against the disease would be advantageous. Cooke<sup>1</sup> stated that the rate of mortality from tetanus in the United States in 1930 was 1.1 per hundred thousand. Children constitute less than 30 per cent of the population, yet 50 per cent of the deaths from tetanus were among them. The infection is dreaded because of the insignificant wounds from which it may occur and because the value of tetanus antitoxin therapeutically leaves much to be desired. The mortality has been lowered considerably by the use of sedatives with the antitoxin.

Children are probably the age group most likely menaced by tetanus from the contamination of wounds with soil. The infection may develop from the most

trivial of injuries. Although passive immunity with prophylactic injections of antitoxin is highly effective, all who treat children know how difficult are the decisions to be made as to whether antitoxin should be given. The wound may be so slight or of such a nature that the parent does not seek medical aid or is not aware of the injury. Antitoxin may not be readily available, the child may be allergic, he may have received serum previously and there is always the possibility of the ever frequent serum sickness. Such thoughts may sway one in the decision to "take a chance" and withhold serum. Often, too, in delayed infections the disease will develop after passive immunity has disappeared. These are some of the reasons that speak for some method of active immunization against the disease.

Both *Corynebacterium diphtheriae* and *Clostridium tetani* produce soluble exotoxins. Ramon<sup>2</sup> in 1924 detoxified diphtheria toxin with a 0.4 per cent solution of formaldehyde and heat. Descombey<sup>3</sup> did the same with tetanus toxin. These detoxified toxins are known as anatoxins or toxoids. Later alum precipitated toxoid was developed by flocculating the detoxified toxin with alum. Both toxins when so modified become nontoxic but retain their antigenic properties.

Jones<sup>4</sup> concluded after a review of the literature and his own work that alum precipitated diphtheria toxoid is a better immunizing agent than unmodified toxoid, and this, in turn, is better than a toxin-antitoxin mixture. He found also that two injections of the alum precipitated toxoid are essential for a durable immunity and that intervals as long as three months between injections give a higher degree of immunity than when short intervals are used. This advantage of alum precipitated toxoid is due to the slow absorption of the comparatively insoluble alum precipitate. This is borne out by the work of Harrison,<sup>5</sup> who found that the nodules which persist at the site of injection retain their antigenic properties for about seven weeks. Experience with tetanus toxoid also seems to bear out the enhanced value of alum precipitated toxoid over plain or unmodified toxoid.

Ramon and Zoeller<sup>6</sup> demonstrated the antigenic properties of tetanus anatoxin or toxoid treated with formaldehyde. Since then both tetanus toxoid treated with formaldehyde and alum precipitated toxoid have been used to immunize human beings by Lincoln and Green-

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Part of the expense of this study was borne by a grant from the Elizabeth McCormick Child Research Fund of the Institute of Medicine of Chicago.

Eli Lilly & Co. supplied the tetanus and diphtheria toxoids. The tetanus toxin for titrations of serum was supplied by the National Institute of Health and Eli Lilly & Co.

Mr. F. G. Jones of Eli Lilly & Co. assisted us in establishing the mouse test technic in our laboratory and gave helpful advice in analyzing the data as well as checking a few of our titrations in his laboratory.

1. Cooke, J. V.: Combined Active Immunization for Diphtheria and Tetanus, *South M. J.* 31:158 (Feb.) 1938.

2. Ramon, G.: Sur la toxine et sur l'anatoxine diphthériques, Pouvoir flocculant et propriétés immunisantes, *Ann. Inst. Pasteur* 38:1 (Jan.) 1924.

3. Descombey, P.: L'anatoxine tétanique, *Compt. rend. Soc. de biol.* 91:239 (July 4) 1924.

4. Jones, F. G.: Duration of Immunity Following Diphtheria Prophylaxis, *J. Lab. & Clin. Med.* 22:576 (March) 1937.

5. Harrison, W. T.: Some Observations on Use of Alum Precipitated Diphtheria Toxoid, *Am. J. Pub. Health* 25:298 (March) 1935.

6. Ramon, G., and Zoeller, C.: Sur la valeur et la durée de l'immunité conférée par l'anatoxine tétanique dans la vaccination de l'homme contre le tétanos, *Compt. rend. Soc. de biol.* 112:347 (Feb. 3) 1933.



wald,<sup>7</sup> Sneath,<sup>8</sup> Sneath and Kerslake,<sup>9</sup> Bergey; Brown and Etris,<sup>10</sup> Jones and Moss,<sup>11</sup> Gold,<sup>12</sup> Brown and Etris,<sup>13</sup> Hall,<sup>14</sup> Hayden and Hall<sup>15</sup> and McBryde,<sup>16</sup> the last-mentioned author working on children.

The results of immunization against tetanus reported by the aforementioned authors showed that tetanus stimulates active immunity against tetanus. The immunizing levels of antitoxin obtained in adults vary from 0.01 to 0.1 unit and up to 2 and 3 units per cubic centimeter of serum. After the first or primary immunization a secondary injection or even subsequent (injection de rappel of the French) ones cause a rapid rise of antitoxin in the blood serum within ten days. It is suggested that if infection with tetanus spores occurs the same stimulation will take place. As yet there is no clinical evidence to corroborate this, but our present knowledge of antigenic response would lead us to believe it to be true.

There is still considerable confusion as to how much antitoxin is necessary to protect one against infection with tetanus. TenBroeck and Bauer<sup>17</sup> have shown that an appreciable amount of tetanus antitoxin was found in the blood serum of persons in China who carried tetanus bacilli in the digestive tract. No one else has been able to corroborate this work. They expressed the belief that this accounts for the low incidence of tetanus in China, where a large percentage of the population harbors tetanus bacilli in the digestive tract. It was reported by Ramon and Lemetayer<sup>18</sup> that since 1928 50,000 horses in the French army have been immunized with tetanus toxoid and that the morbidity and mortality have been nil. The titer of tetanus antitoxin in the blood serum of these horses averaged 0.1 to 1 unit. Ramon and Lemetayer stated that it is known that the presence of 0.001 unit is sufficient to protect the horse against infection with tetanus. Unfortunately there is no simple test simulating the Schick test to serve as a guide, even if the required protective level of antitoxin were known. For that matter not all authors have agreed as to the titer of diphtheria antitoxin in the blood serum necessary for "Schick immunity." The titers cited as necessary vary from 0.03 and 0.01 unit per cubic centimeter of blood serum to as low as 0.004 and 0.002 unit.

The incubation period of the usual infection with tetanus is from five to seven days, but it may be delayed

for from four to five weeks. Sneath<sup>10</sup> determined the levels of antitoxin in the blood serum of adults at various intervals after the prophylactic administration of 1,500 units of antitoxin. He found 0.1 to 0.25 unit of antitoxin per cubic centimeter of blood serum at the end of a week and 0.001 unit after four weeks. Smith<sup>20</sup> found approximately the same levels.

Cowles<sup>21</sup> stated that it is probably impractical to define the minimum titer of antitoxin which will assuredly protect against tetanus. The deciding factor would seem to be the amount of toxin produced by the infection, and to predict this would be impossible. Bergey, Brown and Etris<sup>10</sup> arbitrarily chose 0.01 unit of antitoxin per cubic centimeter of blood serum as the protective level. This can be increased rapidly by giving an additional injection of tetanus toxoid. They have shown by laboratory experiments that the circulating antitoxin, by the mouse test, does not represent the total protection. Immunized guinea pigs having 0.2 unit of antitoxin in the blood per cubic centimeter of serum, computed in terms of humoral activity, will neutralize six thousand minimum lethal doses of tetanus toxin. However, guinea pigs with that level of antitoxin will tolerate an injection of fifteen thousand minimum lethal doses of tetanus toxin without showing evidence of intoxication with tetanus. If the difference between humoral protection and total protection is non-circulating or so-called cellular immunity, then the non-circulating immunity would be at least one and one-half times greater, at least in guinea pigs. Sacquépée<sup>22</sup> expressed the belief that from 0.1 to 0.2 unit of antitoxin per cubic centimeter of serum would probably be sufficient to give a considerable degree of immunity when one takes into consideration the sensitizing effect on the cells concerned in the production of antitoxin. Hall,<sup>14</sup> in citing Ramon and Zoeller, stated: "To judge from the condition in the horse [tolerance of infection of a mass of tetanus spores if the serum neutralizes one single lethal dose of toxin, while a nonvaccinated horse succumbs] this antitoxin titer is still perfectly sufficient to protect these individuals against tetanus." This was said of serums neutralizing from ten to one hundred minimum lethal doses (guinea pig), that is, 0.01 to 0.1 unit of antitoxin per cubic centimeter of serum. Rawlings<sup>23</sup> inoculated guinea pigs with 1 cc. of refined tetanus toxoid. When these guinea pigs were infected with tetanus spores they all survived, while nonimmunized guinea pigs died within five to nine days. Jones and Jamieson<sup>24</sup> found that guinea pigs which have received one or more injections of alum precipitated tetanus toxoid are protected when infected within two months with massive doses of tetanus spores which kill normal pigs in from eighty-eight to one hundred and twelve hours. They found, however, that a massive dose of tetanus spores does not greatly accelerate the production of antitoxin in guinea pigs that have been previously immunized with alum precipitated tetanus toxoid. This is at variance with the theory of cellular immunity in that the same antigen should stimulate the production of antitoxin when that antigen has been

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9. Sneath, P. A. T., and Kerslake, E. G.: Further Observations Following Administration of Tetanus Toxoid, *Canad. M. A. J.* **32**: 132 (Feb.) 1935.

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12. Gold, Harry: Studies on Tetanus Toxoid, *J. A. M. A.* **109**: 481 (Aug. 14) 1937.

13. Brown, C. P., and Etris, S.: Tetanus Toxoid Immunization, *M. Bull. Vet. Admin.* **16**: 25 (July) 1939.

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16. McBryde, S.: Tetanus Immunization with Alum-Precipitated Toxoid, *South. M. J.* **30**: 565 (June) 1937.

17. TenBroeck, Carl, and Bauer, J. H.: Studies on Relation of Tetanus Bacilli in the Digestive Tract to Tetanus Antitoxin in the Blood, *J. Exper. Med.* **37**: 479 (April) 1923; cited by Sneath, Ralph: Immunity to Tetanus, correspondence, *J. A. M. A.* **115**: 1295 (Oct. 12) 1940.

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19. Sneath, P. A. T.: Degree of Protection Provided by Tetanus Toxoid, *Canad. Pub. Health J.* **25**: 195 (April) 1934.

20. Smith, J. H.: On the Absorption of Antibodies from the Subcutaneous Tissues and Peritoneal Cavity, *J. Hyg.* **7**: 205, 1907.

21. Cowles, P. B.: Tetanus Immunization, *Yale J. Biol. & Med.* **9**: 5 (May) 1937.

22. Sacquépée, E.: Immunisation contre le tétanos par l'emploi simultané de sérum et d'anatoxine antitétaniques, *Paris méd.* **1**: 421 (June 3) 1933.

23. Rawlings, W. B., cited by Bergey, Brown and Etris.<sup>10</sup>

24. Jones, F. G., and Jamieson, W. A.: Studies on Tetanus Toxoid, *J. Bact.* **32**: 33 (July) 1936.

used previously. The immunization against tetanus of men and horses in the French army has been obligatory for several years, and to date no instance of tetanus has been reported in an immunized subject.

A unit of tetanus antitoxin is ten times more potent than a unit of diphtheria antitoxin. In other words, 1 unit of tetanus antitoxin will protect a guinea pig weighing 350 Gm. against one thousand minimum lethal doses of tetanus toxin, while 1 unit of diphtheria antitoxin will protect a guinea pig weighing 250 Gm. against only one hundred minimum lethal doses of diphtheria toxin. To calculate the amount of antitoxin in the blood serum one multiplies the titer of 1 cc. of serum by the total volume of serum, which is approximately 50 per cent of the volume of blood. The volume of blood is approximately 7.5 per cent of the subject's weight.

The use of more than one antigen at a time is not new. Multiple vaccinations against diphtheria and smallpox, diphtheria, typhoid and paratyphoid, diphtheria, typhoid and smallpox, and now diphtheria and tetanus all have been done simultaneously with a specific response of antibodies to each antigen as good as if single antigens had been used. Most children are immunized against diphtheria and smallpox near the end of the first year or during the preschool age. It would seem logical, then, to combine the diphtheria and tetanus toxoids and give them at those ages. Few children who have received immunization against tetanus, other than the group of 94 Negro children reported by McBryde,<sup>16</sup> have had determinations done of antitoxin in the blood serum.

#### MATERIAL USED

The material used in this study was both the unmodified (treated with formaldehyde) and alum precipitated combined diphtheria and tetanus toxoids and alum precipitated tetanus toxoid. The diphtheria part of the mixture contained 15 to 20 Lf units per cubic centimeter. The tetanus toxoid contained thirty thousand to thirty-five thousand minimum lethal doses of tetanus toxin per cubic centimeter. The combined toxoids were standardized so that when 9 guinea pigs were each given one dose of 1 cc., the blood serum of each contained 2 units of diphtheria and tetanus antitoxin per cubic centimeter.

**Dose.**—Doses of 1 cc. and 0.5 cc. of the combined toxoids were used. When the alum precipitated tetanus toxoid alone was used the dose was 0.5 cc. For the primary immunization some children received two injections and some three injections at intervals varying from one to three or more months. In a few instances intervals of six months or more were allowed between the first and second injections. Stimulating or subsequent injections of either the tetanus toxoid or the combined diphtheria and tetanus toxoid have been given to some of the group six months, twelve months and longer after primary immunization. The injections were always done subcutaneously in the deltoid or triceps regions of the arm. Alternate arms were used for the injections.

#### PASSIVE IMMUNIZATION AGAINST TETANUS

Tetanus so rarely follows a prophylactic dose of 1,500 units of antitoxin that titers of antitoxin in the blood serum after this procedure should serve as an optimal level for protection. The titers of antitoxin in the blood were obtained on 64 children, aged 3 to 10 years, before injection and at varying intervals following the admin-

istration of the antitoxin. Before injection the blood serum from all subjects contained less than 0.003 unit of antitoxin per cubic centimeter, which is considered negligible. Titrations for lower titers were not made. As can be seen in chart 1, the level of antitoxin was highest during the first week but never was more than 0.5 unit per cubic centimeter of serum, falling to 0.2 unit during the second week, to 0.01 unit during the third week and then further declining to 0.003 unit and lower in the next two weeks. There is a wide variation in titers taken at the same interval on different children. It is evident that not all children respond the same to passive immunity, a level as low as less than 0.003 unit being present in 1 child during the first week and 0.003 unit being common during the third week. The short duration of protection from passive immunity is amply demonstrated.

#### ACTIVE IMMUNITY TO TETANUS

Immunization of the 240 infants and children included in this study was started in the outpatient department of the Children's Memorial Hospital. The ages of the subjects ranged from 8 months to 6 years, each age group being about equally represented. The children all received injections of the combined diphtheria and tetanus toxoids, and they all had repeated determina-

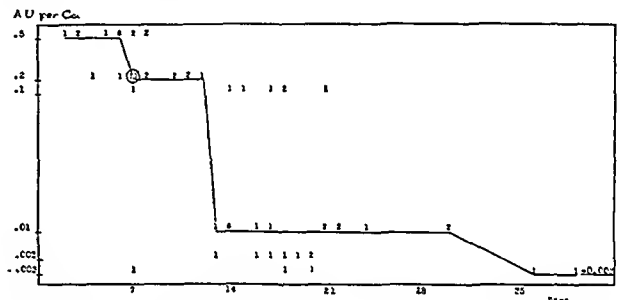


Chart 1.—Levels of antitoxin in the blood serum of children after receiving 1,500 units of tetanus antitoxin.

tions done of the antitoxin content of their blood serums. Titers of antitoxin in the blood were ascertained at varying intervals after the first, second and third injections. Titers were usually determined one to two weeks after the third injection and again later in the year.

**A. After the Primary Injections or Immunization.**—By these terms is meant the development of the basic immunity, such as is developed after injections of diphtheria toxoid. This basic immunity can then be stimulated by subsequent (secondary) injections at any future time. Two injections were used for the primary immunization, except in a small group which was given a course of three injections in order to determine whether there was any advantage in the latter method.

The infants and children considered in table 1 received two injections of 1 cc. of combined diphtheria and tetanus alum precipitated toxoids at intervals of three months. All blood serums on which we had titrations before immunization did not contain tetanus antitoxin in the lowest dilution for which we titrated, which was 0.003 unit per cubic centimeter. Up to three months after the first injection the serums of 12 per cent of the subjects did not contain antitoxin in the lowest dilution for which we titrated, less than 0.003 unit per cubic centimeter. The remainder had varying amounts of antitoxin up to 0.2 unit per cubic centimeter, with an average of 0.071 unit. This is in contrast to the rapid

response of antitoxin after the second inoculation. Titrations frequently were not done during the first two weeks after the second injection, as this was only a part of the primary immunization. But of the serums that were titrated during this period the lowest titer was 0.1 unit per cubic centimeter, with an average of 3.1 units. The response of antitoxin was rapid, averaging 3.52 units per cubic centimeter on the seventh day after the second injection. There was then a fairly rapid fall of antitoxin in the blood serum after one month, the average titer being 1.4 units between the first and third months, 0.26 unit up to six months and 0.22 unit up to twenty-one months. There was no regularity in the degree of response of antitoxin in different children. Although 12 per cent of the children

still had less than 0.003 unit of antitoxin per cubic centimeter of serum after the first injection, they responded as well to the second dose as those with higher levels. While some had high levels immediately after the second injection, all titers tended to decrease to a level within fairly narrow variations from the average after six months. In only 1 child was the amount of antitoxin as low as 0.003 unit three months after the second injection. Unfortunately this child could not be followed further. In 1 child with a previously high titer there was a decrease to 0.003 unit twenty months after the second injection.

A group of 15 children not included in table 1 received for the first injection 1 cc. of the combined alum precipitated toxoids and for the second injection 1 cc. of

TABLE 1.—Antitoxic Titers Following Two Injections of 1 Cc. of Combined Alum Precipitated Diphtheria and Tetanus Toxoids

Patient	Age	Allergy Present	Tetanus Potency				Diphtheria Potency				
			Before Inoculation	3 Months After First Inoculation	After Second Inoculation		Had Previous Diphtheria Immunization	Before Inoculation	3 Months After First Inoculation	After Second Inoculation	
					(Weeks)	(Months)				(Weeks)	(Months)
1	10 yr.	No	—0.003	0.01	0.5 (1)	0.01 (9)	Yes	0.01	2.0	2.0 (1)	2.0 (9)
2	11 yr.	No	.....	0.003	0.1 (1)	0.01 (9) 0.01 (18)	No	.....	—0.002	0.01 (1)	0.01 (9) 0.01 (18)
3	17 mo.	No	—0.003	0.003	2.0 (2)	0.1 (9) 0.003 (30)	...	—0.002	0.002	0.01 (2)	0.01 (9) 0.01 (20)
4	11 mo.	No	—0.003	0.01	.....	1.0 (1) 0.2 (3)	...	—0.002	0.01	.....	0.1 (1) 0.01 (3)
5	1 yr.	Yes	—0.003	—0.003	0.2 (2)	.....	...	—0.002	0.1	0.1 (2)	.....
6	10 mo.	No	—0.003	0.2	.....	0.5 (4)	...	—0.002	—0.002	.....	0.1 (4)
7	5 yr.	No	—0.003	—0.003	2.0 (2)	0.2 (11)	Diphtheria	0.01	1.0	0.1 (2)	0.1 (11)
8	8 yr.	No	—0.003	0.003	2.0 (2)	0.2 (11)	No	—0.002	.....	0.1 (2)	0.1 (11)
9	14 mo.	Yes	—0.003	0.1	0.5 (2)	0.1 (3) 0.1 (18)	...	—0.002	0.1	2.0 (2)	0.1 (3) 0.1 (18)
10	15 mo.	No	—0.003	—0.003	0.1 (2)	.....	No	—0.002	0.003	0.002 (2)	.....
11	5 yr.	Yes	—0.003	0.003	.....	1.0 (1)	Yes	—0.002	0.1	.....	0.1 (3)
12	5 yr.	Yes	—0.003	—0.003	...	0.2 (3)	Yes	.....	—0.002	.....	0.1 (3)
13	10 mo.	No	—0.003	0.2	...	0.5 (2)	No	—0.002	0.1	...	1.0 (2)
14	4 yr.	No	.....	.....	...	0.1 (10)	No	.....	.....	...	1.0 (10)
15	8 mo.	No	—0.003	0.1	...	0.2 (6) 0.2 (12)	...	—0.002	0.01	...	0.1 (6) 0.1 (12)
10	14 mo.	No	—0.003	0.1	.....	1.0 (2) 0.1 (9) 0.01 (21)	...	—0.002	0.1	.....	0.1 (2) 0.01 (9) 0.01 (21)
17	4 yr.	No	—0.003	0.01	.....	0.2 (3)	No	—0.002	0.01	.....	0.1 (3)
18	4 mo.	No	—0.003	0.01	.....	0.5 (3)	No	—0.002	0.01	...	0.1 (3)
19	4 yr.	No	—0.003	0.003	.....	0.1 (3)	...	0.002	0.1	.....	0.1 (3)
20	4 yr.	No	—0.003	0.01	.....	0.1 (3)	No	0.002	2.0	.....	1.0 (3)
21	2 yr.	No	—0.003	0.003	.....	0.5 (3)	No	0.03+	5.0	...	5.0 (3)
22	2 yr.	No	—0.003	0.1	.....	5.0 (1) 0.01 (4) 0.2 (8)	No	.....	0.01	.....	0.1 (1) 0.1 (4) 0.01 (8)
23	2 yr.	No	—0.003	—0.003	.....	0.003 (3)	...	—0.002	0.002	.....	.....
24	2 yr.	No	—0.003	0.2	.....	1.0 (1) 2.0 (3)	...	—0.002	0.01	.....	0.1 (3)
25	4 yr.	No	—0.003	0.1	.....	1.0 (2) 0.2 (14)	No	0.002	0.1	.....	5.0 (2) 0.1 (14)
26	17 mo.	No	—0.003	0.1	.....	5.0 (1) 1.0 (3)	...	—0.002	0.01	.....	0.1 (1) 0.1 (3)
27	4 yr.	No	—0.003	0.01	.....	2.0 (1) 0.5 (2)	No	.....	0.01	.....	0.1 (1) 0.1 (2)
28	17 mo.	No	—0.003	0.1	.....	2.0 (2)	No	—0.002	.....	.....	0.1 (2)
29	18 mo.	No	—0.003	0.01	.....	0.5 (3)	No	—0.002	0.002	.....	0.01 (3)
30	2 yr.	No	—0.003	0.01	.....	0.5 (3)	No	—0.002	0.1	.....	1.0 (3)
31	3 yr.	No	—0.003	0.01	.....	1.0 (2) 0.2 (9)	Yes	0.03+	2.0	.....	2.0 (2) 0.1 (9)
32	2 yr.	No	—0.003	0.1	.....	2.0 (2) 0.5 (9)	No	—0.002	0.01	.....	0.1 (2) 0.1 (9)
33	2 yr.	No	—0.003	0.01	.....	0.5 (3)	No	—0.002	0.1	.....	0.1 (3)
34	6 yr.	No	—0.003	0.01	.....	1.0 (2) 0.5 (9)	...	0.03+	5.0+	.....	5.0+ (2) 2.0 (9)
35	2 yr.	No	—0.003	0.2	.....	0.2 (2) 0.2 (9) 0.2 (15)	...	—0.002	.....	.....	0.1 (2) 0.01 (9) 0.01 (15)
36	2 yr.	Yes	—0.003	—0.003	.....	0.2 (2) 0.1 (12)	No	—0.002	—0.01	.....	0.1 (2) 0.002 (12)
37	19 mo.	No	—0.003	0.01	.....	0.5 (7) 0.1 (12)	...	—0.002	0.1	.....	0.1 (7) 0.01 (12)
38	2 yr.	No	—0.003	0.01	.....	0.5 (5)	...	—0.002	0.01	.....	0.01 (5)
39	2 yr.	Yes	—0.003	0.1	.....	0.1 (15)	...	—0.002	0.01	.....	0.1 (15)

TABLE 1.—Antitoxic Titers Following Two Injections of 1 Cc. of Combined Alum Precipitated Diphtheria and Tetanus Toxoids  
—Continued

Diphtheria Potency											
Patient	Age	Allergy Present	Tetanus Potency				Had Previous Diphtheria Immunization	Diphtheria Potency			
			Before Inoculation	3 Months After First Inoculation	After Second Inoculation			Before Inoculation	3 Months After First Inoculation	After Second Inoculation	
					(Weeks)	(Months)				(Weeks)	(Months)
40	2 yr.	No	—0.003	0.01	.....	0.1 (6) 0.01 (10)	No	—0.002	0.1	.....	0.1 (6) 0.01 (10)
41	20 mo.	No	—0.003	0.1+	.....	0.1 (6)	No	—0.002	.....	.....	0.01 (6)
42	2 yr.	No	—0.003	0.1	.....	0.2 (6)	No	—0.002	0.01	.....	0.1 (6)
43	11 mo.	No	—0.003	.....	.....	0.1 (6)	...	—0.002	.....	.....	0.01 (6)
44	10 mo.	No	—0.003	0.1	.....	0.5 (6) 0.2 (12)	...	—0.002	0.01	.....	0.01 (12)
45	11 mo.	No	—0.003	0.1	.....	0.2 (6) 0.1 (12)	...	—0.002	0.01	.....	0.1 (6) 0.1 (12)
46	2 yr.	No	—0.003	0.1	5.0 (2)	0.5 (8)	No	—0.002	0.1	0.1 (1)	0.1 (8)
47	11 mo.	No	.....	0.01	2.0 (2)	0.1 (8)	No	.....	0.1	0.1 (2)	0.01 (8)
48	10 mo.	No	.....	0.1	5.0 (2)	.....	...	.....	0.01	0.1 (2)	.....
49	1 yr.	Yes	.....	0.1	.....	5.0 (1) 0.5 (3)	No	.....	0.1	.....	0.1 (1) 0.1 (3)
50	17 mo.	No	.....	0.2	.....	0.5 (3)	Yes	.....	1.0	.....	2.0 (3)
51	10 mo.	Yes	.....	0.01	.....	0.2 (6)	No	.....	0.002	.....	0.1 (6)
52	11 mo.	No	.....	0.003	.....	0.01 (7)	No	.....	0.01	.....	0.01 (7)
53	10 mo.	No	.....	0.2	.....	.....	No	.....	0.01	.....	.....
54	18 mo.	No	.....	0.1	.....	5.0 (1) 1.0 (3)	...	.....	—0.002	.....	0.01 (1) 0.01 (3)
55	11 mo.	No	.....	0.01	.....	1.0 (3)	No	.....	0.1	.....	0.1 (3)
56	11 mo.	Yes	.....	0.2	.....	0.2 (14)	...	.....	0.1	.....	1.0 (14)
57	15 mo.	Yes	.....	0.2	2.0 (1)	0.1 (11)	...	.....	0.01	0.1 (1)	0.1 (11)
58	1 yr.	No	.....	0.003	.....	2.0 (1)	...	.....	0.01	.....	2.0 (1)
59	10 mo.	Yes	.....	.....	.....	5.0 (1) 1.0 (10)	...	.....	.....	.....	5.0 (1) 0.1 (10)
60	1 yr.	Yes	.....	.....	10.0 (2)	.....	...	.....	.....	1.0 (2)	.....
61	11 mo.	No	.....	—0.003	.....	5.0 (1) 2.0 (11)	...	.....	0.002	.....	2.0 (1) 0.1 (11)
62	15 mo.	No	.....	.....	.....	1.0 (1) 0.01 (9)	...	.....	.....	.....	5.0 (1) 0.01 (9)
63	13 mo.	...	.....	0.1	10.0 (2)	0.5 (10)	...	.....	0.01	2.0 (2)	0.1 (10)
64	4 yr.	No	.....	0.003	.....	2.0 (2)	No	.....	0.1	.....	1.0 (2)
65	18 mo.	Yes	.....	0.2	.....	1.0 (3)	No	.....	0.01	.....	0.01 (3)
66	17 mo.	Yes	.....	.....	10.0 (1)	0.5 (6)	No	.....	.....	0.1 (1)	2.0 (6)
67	7 yr.	No	.....	.....	0.5 (2)	0.1 (9)	...	.....	.....	0.1 (2)	0.01 (9)
68	9 yr.	No	.....	.....	1.0 (2)	0.01 (9)	...	.....	.....	1.0 (2)	0.01 (9)
69	6 yr.	Yes	.....	.....	.....	0.5 (3) 0.1 (9)	...	.....	.....	.....	2.0 (3) 0.1 (9)

the combined unmodified (non-alum precipitated) toxoid. The average titer of the serums of these subjects one to two weeks after the second injection was 1.73 units per cubic centimeter, from one to three months after 1.28 units and from six to twelve months after 0.14 unit. In this group 1 child had only 0.003 unit of antitoxin per cubic centimeter of serum one week after the second injection but 0.01 unit at the end of ten months. A third injection of 0.5 cc. of alum precipitated tetanus toxoid was given at this time, and at the end of seven days his serum contained 2 units of antitoxin per cubic centimeter. Another child had only 0.003 unit of antitoxin per cubic centimeter of serum two months after the second injection, which decreased to less than 0.003 unit at the end of twelve months. As this child also did not have sufficient diphtheria antitoxin after the two injections to give a positive cutaneous reaction in the rabbit with our lowest dilution of serum, which was for less than 0.002 unit, it can be assumed that he was one of those persons whose mechanism for producing antibodies cannot be stimulated, at least in diphtheria and tetanus. This was the only case in the series in which this seemed true. Unfortunately the child failed to return for further study, so that we do not know what the results of further inoculations would have been. The response to plain (unmodified) toxoid was adequate, but the average content of antitoxin in the serum was lower than when alum precipitated toxoids were used.

A third group of 14 children received as their second injection only 0.5 cc. of the combined alum precipitated

toxoid one to three months after the first injection of 1 cc. of the combined alum precipitated toxoid. One to two weeks after the second injection the lowest content of antitoxin was 0.1 unit per cubic centimeter of serum, with an average of 1.1 units. From one to three months afterward it was 1.15 units and after six to twelve months was 0.05 unit. The response of tetanus antitoxin in this group was adequate but also lower than when two injections of 1 cc. were used.

The patients considered in table 2 each received two doses of only 0.5 cc. of the combined alum precipitated toxoid as their primary immunization. After the first injection the serums of 15 per cent of the subjects did not contain antitoxin in the lowest dilution for which we titrated, which was less than 0.003 unit per cubic centimeter. The average titration of the others was 0.05 unit per cubic centimeter. Within two weeks of the second injection the average titer was 1.81 units per cubic centimeter. Only 1 child had a titer as low as 0.01 unit, the others having at least 0.1 unit. In one to three months the titers averaged 0.57 unit and in from three to twelve months 0.14 unit. Many children responded to two injections of 0.5 cc. of the combined toxoids as well as those averaging doses of 1 cc., but the average titer of antitoxin was somewhat lower. It was, however, sufficiently high to give a good immunity.

Another group of 13 children who received two 0.5 cc. doses of the unmodified toxoids developed antitoxin titers considerably lower than with the alum precipitated toxoids. There was, however, an adequate response when a third injection was given.

A definite and satisfactory response to tetanus toxoid is evident within one week after the second injection, and this response is maintained for a month. There is then a gradual drop in the content of antitoxin, but it is still probably high enough for protection up to the end of one year at least. It should be remembered, however, that the second injection of toxoid is con-

alum precipitated tetanus toxoid after an interval of from one to twelve months. There now occurred a rapid production of antitoxin to a high level, the average titer of antitoxin being 3.79 units per cubic centimeter of serum during the first two weeks. The average titer was 3.65 units on the seventh day and 4.3 units on the fourteenth day. Only 1 child had a titer as low as

TABLE 2.—Antitoxic Titers Following Two Injections of 0.5 Cc. of Combined Alum Precipitated Diphtheria and Tetanus Toxoids

Patient	Age	Allergy Present	Tetanus Potency				Had Previous Diphtheria Immunization	Diphtheria Potency			
			Before First Inoculation	After First Inoculation (Months)	After Second Inoculation			Before First Inoculation	After First Inoculation (Months)	After Second Inoculation	
					(Weeks)	(Months)				(Weeks)	(Months)
1	21 mo.	Yes	-0.003	0.2 (3)	.....	0.5 (2) 0.1 (9)	No	-0.002	.....	.....	0.1 (2) 0.01 (9)
2	2 yr.	No	-0.003	0.1 (3)	.....	2.0 (1) 0.5 (3)	No	-0.002	.....	.....	5.0 (1) 1.0 (3)
3	2 yr.	No	-0.003	0.01 (3)	.....	0.1 (6)	No	-0.002	0.01 (3)	.....	0.01 (6)
4	2 yr.	No	-0.003	.....	2.0 (2)	0.1 (8)	No	-0.002	.....	0.1 (2)	0.01 (8)
5	22 mo.	No	.....	.....	2.0 (2)	0.2 (10)	No	.....	.....	5.0 (5)	0.1 (10)
6	2 yr.	No	-0.003	.....	5.0 (2)	.....	No	-0.002	.....	1.0 (2)	.....
7	3 yr.	No	-0.003	0.003 (3)	1.0 (2)	0.5 (10)	No	-0.002	0.01 (3)	2.0 (2)	0.1 (10)
8	3 yr.	No	-0.003	0.01 (3)	1.0 (2)	0.01 (8)	No	.....	5.0 (3)	10.0 (2)	0.1 (8)
9	3 yr.	No	-0.003	-0.003 (3)	0.2 (2)	.....	No	-0.002	0.002 (3)	0.1 (2)	.....
10	2 yr.	No	-0.003	0.01 (3)	.....	2.0 (1) 0.2 (9)	No	.....	0.01 (3)	.....	1.0 (1) 0.01 (9)
11	13 mo.	Yes	-0.003	-0.003 (1) 0.01 (3)	2.0 (2)	0.2 (6)	...	.....	0.01 (1) 0.01 (3)	2.0 (2)	0.1 (6)
12	9 mo.	Yes	.....	.....	.....	0.5 (1) 0.01 (8)	No	.....	.....	.....	0.1 (1) 0.01 (8)
13	10 mo.	No	.....	.....	.....	0.5 (2) 0.01 (8)	No	.....	.....	.....	0.1 (2) 0.01 (8)
14	14 mo.	No	..	-0.003 (1)	1.0 (2)	0.1 (11)	No	.....	0.002 (1)	5.0 (2)	0.1 (11)
15	10 mo.	No	-0.003	0.01 (3)	1.0 (2)	0.2 (8)	...	-0.002	0.01 (3)	2.0 (2)	0.01 (8)
16	13 mo.	No	-0.003	0.003 (2)	5.0 (2)	.....	...	-0.002	0.01 (2)	0.1 (2)	.....
17	13 mo.	No	-0.003	-0.003 (3)	2.0 (2)	1.0 (2)	No	-0.002	0.002 (3)	0.1 (2)	0.1 (2)
18	14 mo.	No	.....	.....	.....	0.5 (2) 0.1 (11)	No	.....	.....	.....	1.0 (2) 0.1 (11)
19	11 mo.	No	.....	0.1 (3)	.....	0.5 (1) 0.2 (3)	No	.....	0.1 (3)	.....	1.0 (1) 0.1 (3)
20	11 mo.	No	.....	0.1 (3)	.....	0.5 (3)	No	.....	0.01 (3)	.....	0.1 (3)
21	11 mo.	Yes	.....	.....	.....	0.5 (2) 0.01 (12)	...	.....	.....	.....	0.1 (2) 0.01 (12)
22	13 mo.	Yes	.....	0.1 (3)	2.0 (2)	.....	...	.....	0.01 (3)	2.0 (2)	.....
23	8 mo.	No	.....	0.01 (3)	.....	0.5 (1) 0.2 (3)	...	.....	0.01 (3)	.....	0.1 (1) 0.01 (3)
24	1 yr.	No	.....	0.01 (3)	.....	0.2 (2) 0.01 (11)	No	.....	0.01 (3)	.....	0.1 (2) 0.1 (11)
25	2 yr.	Yes	.....	0.01 (3)	.....	1.0 (1) 0.1 (6)	No	.....	0.002 (3)	.....	0.1 (1) 0.01 (6)
26	11 mo.	No	.....	0.1 (3)	.....	1.0 (1)	...	.....	0.01 (3)	.....	0.1 (1)
27	1 yr.	No	.....	.....	10.0 (1)	0.2 (12)	...	.....	.....	1.0 (1)	0.01 (12)
28	13 mo.	No	.....	.....	0.2 (1)	0.1 (6) 0.1 (12)	No	.....	.....	0.1 (1)	0.1 (6) 0.1 (12)
29	16 mo.	Yes	.....	.....	0.01 (1)	0.1 (5) 0.01 (11)	No	.....	.....	15.0+ (1)	20.0 (5) 15.0 (11)
30	6 yr.	Yes	.....	.....	0.1 (1)	0.01 (11)	...	.....	.....	1.0 (1)	0.1 (11)
31	3 yr.	Yes	.....	.....	0.1 (1)	0.5 (12)	...	.....	.....	0.01 (1)	0.1 (12)
32	11 mo.	Yes	.....	.....	0.5 (1)	0.2 (14)	...	.....	.....	0.1 (1)	0.01 (14)
33	10 yr.	Yes	.....	.....	.....	0.01 (1)	No	.....	.....	.....	0.01 (1)
33	10 yr.	Yes	.....	.....	.....	0.1 (1)	...	.....	.....	.....	0.1 (1)
34	11 mo.	No	.....	.....	.....	0.1 (6)	...	.....	.....	.....	0.1 (6)
35	2 yr.	...	.....	.....	.....	0.1 (3)	...	.....	.....	.....	0.1 (3)
36	2 yr.	...	.....	.....	.....	0.2 (1)	...	.....	.....	.....	0.1 (1)
36	2 yr.	...	.....	.....	.....	.....	...	.....	0.1 (3)	.....	0.1 (3)
37	13 mo.	...	.....	0.1 (3)	.....	0.2 (5)	...	.....	0.01 (5)	.....	0.1 (5)
38	2 yr.	No	.....	0.01 (5)	.....	0.1 (17)	...	.....	.....	.....	0.1 (17)
39	2 yr.	No	.....	0.003 (6)	1.0+ (1)	0.01 (8)	No	.....	0.002 (6)	2.0 (1)	0.1 (8)
40	17 mo.	No	.....	0.01 (5)	1.0 (1)	0.1 (6)	...	.....	0.01 (5)	1.0 (1)	0.1 (6)
41	13 mo.	Yes	.....	0.01 (2)	.....	0.5 (4)	...	.....	0.01 (2)	.....	0.1 (4)
41	13 mo.	Yes	.....	.....	.....	0.1 (2)	No	.....	.....	.....	0.01 (2)
42	3 yr.	...	.....	.....	.....	.....	...	.....	.....	.....	.....

sidered a part of the basic immunization, and a stimulating injection any time later produces a still higher level of antitoxin as will be shown later.

**B. Effect of Stimulating or Secondary Injection of Tetanus Toxoid.**—In table 3 are grouped observations on those children whose primary immunization was made up of two injections of 1 cc. of the combined toxoids and who received a stimulating or secondary injection of 1 cc. of the combined toxoids or 0.5 cc. of

0.2 unit one week after the stimulating injection, the others having titers of at least 1 unit and 1 as high as 35 units. Even though the response of antitoxin may be low after the second injection, there is good response after the stimulating inoculation, as was illustrated in a certain child. Before the first injection in this child and one and three months after the second injection no antitoxin was present in the lowest dilution for which antitoxin was titrated, i. e., less than 0.003 unit.

Ten months after the second injection his serum contained 0.01 unit of antitoxin. Within seven days after the stimulating injection 2 units of antitoxin per cubic centimeter of serum was present. As after the second injection, there again occurred a decrease in antitoxin,

as their primary immunization and who then received 0.5 cc. of tetanus toxoid one to eleven months later as a stimulating injection. There was again a rapid production of antitoxin. The average level of antitoxin was 6.78 units by the fourteenth day. This was higher

TABLE 3.—*Response to Stimulating Dose Following Two Primary Injections of Combined Alum Precipitated Diphtheria and Tetanus Toxoids*

Patient	Age	Allergy Present	Tetanus Potency			Stimulating Dose After Second Inoculation (Months)	Had Previous Diphtheria Immunization	Diphtheria Potency		
			After Second Inoculation (Months)	After Stimulating Dose				After Second Inoculation (Months)	After Stimulating Dose	
				(Weeks)	(Months)				(Weeks)	(Months)
1	1 yr.	No	0.2 (3)	.....	1.0 (7)	Combined (3)	...	0.01 (3)	.....	0.1 (7)
2	1 yr.	Yes	0.2 (1)	.....	0.1 (8) 0.01(21)	Combined (1)	...	0.1 (1)	.....	0.1 (8) 0.1 (21)
3	5 yr.	No	0.2 (11)	5.0 (1)	0.2 (10)	Tetanus 0.5 cc. (11)	Diphtheria	0.1 (11)	0.1 (1)	0.1 (10)
4	8 yr.	No	0.2 (11)	2.0 (1)	0.2 (10)	Tetanus 0.5 cc. (11)	No	0.1 (11)	0.01 (1)	.....
5	8 yr.	No	0.0 (12)	2.0 (1)	.....	Tetanus 0.5 cc. (12)	...	1.0 (12)	2.0 (1)	.....
6	5 yr.	Yes	1.0 (3)	2.0 (1)	0.2 (12)	Tetanus 0.5 cc. (3)	Yes	0.1 (3)	2.0 (1)	0.1 (12)
7	5 yr.	Yes	0.2 (3)	5.0 (2)	0.2 (12)	Tetanus 0.5 cc. (3)	Yes	0.1 (3)	0.1 (2)	0.01(12)
8	10 mo.	No	0.5 (2)	.....	5.0 (1) 0.5 (6) 0.2 (17)	Combined (2)	No	1.0 (2)	.....	1.0 (1) 0.1 (6) 0.1 (17)
9	4 yr.	No	0.1 (10)	1.0 (1)	.....	Combined (10)	No	1.0 (10)	5.0 (1)	.....
10	4 yr.	No	0.2 (3)	5.0 (1)	0.5 (11)	Combined (3)	No	0.1 (3)	5.0 (1)	0.1 (11)
11	4 mo.	No	0.5 (3)	2.0 (2)	0.5 (9)	Tetanus 0.5 cc. (3)	No	0.1 (3)	0.1 (2)	0.1 (9)
12	4 yr.	No	0.1 (3)	2.0 (1)	0.1 (11)	Tetanus 0.5 cc. (3)	Schick negative	0.1 (3)	1.0 (1)	0.1 (11)
13	4 yr.	No	0.1 (3)	5.0 (1)	.....	Combined (3)	No	1.0 (3)	5.0 (1)	.....
14	2 yr.	No	0.5 (3)	1.0 (1)	0.2 (9)	Tetanus 0.5 cc. (3)	No	5.0 (3)	5.0 (1)	1.0 (9)
15	2 yr.	...	2.0 (3)	1.0 (1)	0.5 (8)	Tetanus 0.5 cc. (3)	...	0.1 (3)	0.1 (1)	0.01 (8)
16	2 yr.	Yes	.....	2.0 (1)	0.2 (10)	Tetanus 0.5 cc. (1)	...	.....	1.0 (1)	1.0 (10)
17	17 mo.	No	1.0 (3)	5.0 (1)	1.0 (11)	Combined (3)	...	0.1 (3)	2.0 (1)	0.1 (11)
18	4 yr.	No	0.5 (2)	0.2 (1)	0.1 (7) 0.1 (12)	Tetanus 0.5 cc. (2)	No	0.1 (2)	0.1 (1)	0.1 (7)
19	17 mo.	No	2.0 (2)	5.0 (1)	0.5 (7) 0.2 (12)	Combined (2)	No	0.1 (2)	2.0 (1)	0.1 (7) 0.1 (12)
20	2 yr.	No	0.5 (3)	2.0 (1)	0.5 (5) 0.2 (17)	Tetanus 0.5 cc. (3)	No	1.0 (3)	1.0 (1)	0.1 (5) 0.1 (17)
21	3 yr.	No	0.2 (9)	2.0 (1)	.....	Tetanus 0.5 cc. (9)	Yes	0.1 (9)	1.0 (1)	.....
22	16 mo.	No	.....	5.0 (1)	0.5 (12)	Combined (3)	...	.....	5.0 (1)	5.0 (12)
23	2 yr.	No	0.5 (3)	2.0 (1)	0.1 (12)	Combined (3)	No	0.1 (3)	2.0 (1)	0.1 (12)
24	2 yr.	No	0.5 (5)	1.0 (1)	0.2 (12)	Tetanus 0.5 cc. (5)	No	0.01 (5)	0.1 (1)	0.01(12)
25	20 mo.	No	0.1 (6)	2.0 (1)	0.2 (7)	Tetanus 0.5 cc. (6)	No	0.01 (6)	0.01 (1)	0.01 (7)
26	3 yr.	No	0.2 (6)	2.0 (1)	0.2 (5)	Tetanus 0.5 cc. (6)	No	0.1 (6)	0.1 (1)	0.1 (5)
27	11 mo.	No	0.1 (6)	2.0 (1)	0.01(12)	Tetanus 0.5 cc. (6)	No	0.01 (6)	0.01 (1)	0.01(12)
28	1 yr.	Yes	0.5 (3)	2.0 (1)	0.5 (6)	Tetanus 0.5 cc. (3)	No	0.1 (3)	0.1 (1)	0.01 (6)
29	17 mo.	No	0.5 (3)	5.0 (2)	2.0 (5)	Tetanus 0.5 cc. (3)	Yes	2.0 (3)	1.0 (2)	2.0 (5)
30	10 mo.	Yes	0.2 (6)	2.0 (1)	0.5 (11)	Combined (6)	No	0.1 (6)	1.0 (1)	0.1 (11)
31	11 mo.	No	0.01 (7)	2.0 (1)	.....	Combined (7)	No	0.1 (7)	1.0 (1)	.....
32	18 mo.	No	1.0 (3)	1.0 (3)	0.2 (9)	Combined 0.5 cc.(3)	No	0.01 (3)	0.1 (3)	0.01 (9)
33	11 mo.	No	1.0 (3)	.....	1.0 (5) 1.0 (10)	Combined (3)	No	0.1 (3)	.....	0.1 (5) 1.0 (10)
34	10 mo.	Yes	.....	5.0 (1)	0.2 (12)	Combined (1)	...	.....	5.0 (1)	0.1 (12)
35	18 mo.	No	0.5 (10)	35.0 (1)	.....	Tetanus 0.5 cc. (10)	No	0.1 (10)	0.1 (1)	.....
36	17 mo.	Yes	0.5 (6)	10.0 (1)	.....	Tetanus 0.5 cc. (6)	No	2.0 (6)	1.0 (1)	.....
37	15 mo.	No	0.5 (4)	2.0 (1)	0.2 (6)	Tetanus 0.5 cc. (4)	...	0.1 (4)	0.1 (1)	0.1 (6)
38	15 mo.	No	0.5 (4)	1.0 (1)	0.1 (6)	Tetanus 0.5 cc. (4)	...	0.1 (4)	0.1 (1)	0.01 (6)
39	13 mo.	Yes	1.0 (3)	2.0 (2)	0.5 (8)	Tetanus 0.5 cc. (3)	No	0.1 (3)	0.1 (2)	0.1 (8)
40	15 mo.	No	0.1 (4)	15.0 (2)	2.0 (6) 1.0 (10)	Tetanus 0.5 cc. (4)	...	0.1 (4)	0.1 (2)	0.1 (6) 0.1 (10)
41	1 yr.	Yes	0.5 (1)	1.0 (1)	0.2 (14)	Tetanus 0.5 cc. (1)	No	1.0 (1)	0.1 (1)	0.1 (14)
42	1 yr.	Yes	1.0 (1)	1.0 (1)	0.1 (12)	Combined (1)	No	0.1 (1)	0.1 (1)	0.01(12)
43	18 mo.	No	0.5 (2)	.....	1.0 (2) 0.2 (9)	Tetanus 0.5 cc. (2)	No	0.1 (2)	.....	0.1 (2) 0.1 (9)
44	10 mo.	No	1.0 (1)	2.0 (2)	0.1 (12)	Tetanus 0.5 cc. (1)	No	0.1 (1)	1.0 (2)	0.1 (12)
45	18 mo.	No	.....	2.0 (1)	.....	Tetanus 0.5 cc. (1)	...	.....	0.1 (1)	.....
46	18 mo.	Yes	0.5 (1)	5.0 (1)	0.5 (10)	Tetanus 0.5 cc. (1)	No	2.0 (1)	1.0 (1)	0.01(10)
47	3 yr.	No	0.2 (1)	2.0 (3)	0.2 (10)	Combined (1)	No	1.0 (1)	1.0 (3)	0.1 (10)
48	17 mo.	No	2.0 (2)	.....	0.5 (5)	Tetanus 0.5 cc. (8)	No	0.1 (2)	.....	0.01 (5)
49	15 mo.	No	1.0 (2)	.....	0.1 (10)	Tetanus 0.5 cc. (2)	...	0.1 (2)	.....	0.01(10)
50	11 mo.	No	2.0 (10)	.....	5.0 (3)	Tetanus 0.5 cc. (10)	...	0.1 (10)	.....	1.0 (3)
51	10 mo.	Yes	0.01(11)	5.0 (2)	.....	Tetanus 0.5 cc. (11)	No	0.1 (11)	2.0 (2)	.....

the average titer between the first and sixth month being 1.42 units and then a rapid decrease to 0.33 unit taking place by the end of the year. It is to be noted, however, that only one titer fell as low as 0.01 unit in a year, with all other titers 0.1 unit or more.

Table 4 includes observations on those children who received two doses of 0.5 cc. of the combined toxoids

than the average in the preceding group because of several high titers in such a small group. The usual decrease in levels of antitoxin occurred with an average of 1.6 units by the sixth month and 0.15 unit by the end of the year.

It is evident from the foregoing figures that a high, rapid response of antitoxin occurs in children immunized

A definite and satisfactory response to tetanus toxoid is evident within one week after the second injection, and this response is maintained for a month. There is then a gradual drop in the content of antitoxin, but it is still probably high enough for protection up to the end of one year at least. It should be remembered, however, that the second injection of toxoid is con-

alum precipitated tetanus toxoid after an interval of from one to twelve months. There now occurred a rapid production of antitoxin to a high level, the average titer of antitoxin being 3.79 units per cubic centimeter of serum during the first two weeks. The average titer was 3.65 units on the seventh day and 4.3 units on the fourteenth day. Only 1 child had a titer as low as

TABLE 2.—Antitoxic Titers Following Two Injections of 0.5 Cc. of Combined Alum Precipitated Diphtheria and Tetanus Toxoids

		Tetanus Potency				Diphtheria Potency					
Patient	Age	Allergy Present	Before First Inoculation	After First Inoculation (Months)	After Second Inoculation		Had Previous Diphtheria Immunization	Before First Inoculation	After First Inoculation (Months)	After Second Inoculation	
					(Weeks)	(Months)				(Weeks)	(Months)
1	21 mo.	Yes	-0.003	0.2 (3)	.....	0.5 (2) 0.1 (9)	No	-0.002	.....	.....	0.1 (2) 0.01 (9)
2	2 yr.	No	-0.003	0.1 (3)	.....	2.0 (1) 0.5 (3)	No	-0.002	.....	.....	5.0 (1) 1.0 (3)
3	2 yr.	No	-0.003	0.01 (3)	.....	0.1 (6)	No	-0.002	0.01 (3)	.....	0.01 (6)
4	2 yr.	No	-0.003	.....	2.0 (2)	0.1 (8)	No	-0.002	.....	0.1 (2)	0.01 (8)
5	22 mo.	No	.....	.....	2.0 (2)	0.2 (10)	No	.....	.....	5.0 (5)	0.1 (10)
6	2 yr.	No	-0.003	.....	5.0 (2)	.....	No	-0.002	.....	1.0 (2)	.....
7	3 yr.	No	-0.003	0.003 (3)	1.0 (2)	0.5 (10)	No	-0.002	0.01 (3)	2.0 (2)	0.1 (10)
8	3 yr.	No	-0.003	0.01 (3)	1.0 (2)	0.01 (8)	No	.....	5.0 (3)	10.0 (2)	0.1 (8)
9	3 yr.	No	-0.003	-0.003 (3)	0.2 (2)	.....	No	-0.002	0.002 (3)	0.1 (2)	.....
10	2 yr.	No	-0.003	0.01 (3)	.....	2.0 (1) 0.2 (9)	No	.....	0.01 (3)	.....	1.0 (1) 0.01 (9)
11	13 mo.	Yes	-0.003	-0.003 (1) 0.01 (3)	2.0 (2)	0.2 (6)	...	.....	0.01 (1) 0.01 (3)	2.0 (2)	0.1 (6)
12	9 mo.	Yes	.....	.....	.....	0.5 (1) 0.01 (8)	No	.....	.....	.....	0.1 (1) 0.01 (8)
13	10 mo.	No	.....	.....	.....	0.5 (2) 0.01 (8)	No	.....	.....	.....	0.1 (2) 0.01 (8)
14	14 mo.	No	..	-0.003 (1)	1.0 (2)	0.1 (11)	No	.....	0.002 (1)	5.0 (2)	0.1 (11)
15	10 mo.	No	-0.003	0.01 (3)	1.0 (2)	0.2 (8)	...	-0.002	0.01 (3)	2.0 (2)	0.01 (8)
16	13 mo.	No	-0.003	0.003 (2)	5.0 (2)	.....	...	-0.002	0.01 (2)	0.1 (2)	.....
17	13 mo.	No	-0.003	-0.003 (3)	2.0 (2)	1.0 (2)	No	-0.002	0.002 (3)	0.1 (2)	0.1 (2)
18	14 mo.	No	.....	.....	.....	0.5 (2) 0.1 (11)	No	.....	.....	.....	1.0 (1) 0.1 (11)
19	11 mo.	No	.....	0.1 (3)	.....	0.5 (1) 0.2 (3)	No	.....	0.1 (3)	.....	1.0 (1) 0.1 (3)
20	11 mo.	No	.....	0.1 (3)	.....	0.5 (3)	No	.....	0.01 (3)	.....	0.1 (3)
21	11 mo.	Yes	.....	.....	.....	0.5 (2) 0.01 (12)	...	.....	.....	.....	0.1 (2) 0.01 (12)
22	13 mo.	Yes	.....	0.1 (3)	2.0 (2)	.....	...	.....	0.01 (3)	2.0 (2)	.....
23	8 mo.	No	.....	0.01 (3)	.....	0.5 (1) 0.2 (3)	...	.....	0.01 (3)	.....	0.1 (1) 0.01 (3)
24	1 yr.	No	.....	0.01 (3)	.....	0.2 (2) 0.01 (11)	No	.....	0.01 (3)	.....	0.1 (2) 0.1 (11)
25	2 yr.	Yes	.....	0.01 (3)	.....	1.0 (1) 0.1 (6)	No	.....	0.002 (3)	.....	0.1 (1) 0.01 (6)
26	11 mo.	No	.....	0.1 (3)	.....	1.0 (1)	...	.....	0.01 (3)	.....	0.1 (1)
27	1 yr.	No	.....	.....	10.0 (1)	0.2 (12)	...	.....	.....	1.0 (1)	0.01 (12)
28	13 mo.	No	.....	.....	0.2 (1)	0.1 (6) 0.1 (12)	No	.....	.....	0.1 (1)	0.1 (6) 0.1 (12)
29	16 mo.	Yes	.....	.....	0.01 (1)	0.1 (5) 0.01 (11)	No	.....	.....	15.0+ (1)	20.0 (5) 15.0 (11)
30	6 yr.	Yes	.....	.....	0.1 (1)	0.01 (11)	...	.....	.....	1.0 (1)	0.1 (11)
31	3 yr.	Yes	.....	.....	0.1 (1)	0.5 (12)	...	.....	.....	0.01 (1)	0.1 (12)
32	11 mo.	Yes	.....	.....	0.5 (1)	0.2 (14)	...	.....	.....	0.1 (1)	0.01 (14)
33	10 yr.	Yes	.....	.....	.....	0.01 (1)	No	.....	.....	.....	0.01 (1)
34	11 mo.	No	.....	.....	.....	0.1 (1) 0.1 (6)	...	.....	.....	.....	0.1 (1) 0.1 (6)
35	2 yr.	...	.....	.....	.....	0.1 (3)	...	.....	.....	.....	0.1 (3)
36	2 yr.	...	.....	.....	.....	0.2 (1)	...	.....	0.1 (3)	.....	.....
37	13 mo.	...	.....	0.1 (3)	.....	0.2 (5) 0.1 (17)	...	.....	0.01 (5)	.....	0.1 (5) 0.1 (17)
38	2 yr.	No	.....	0.003 (6)	1.0+ (1)	0.01 (8)	No	.....	0.002 (6)	2.0 (1)	0.1 (8)
39	2 yr.	No	.....	0.01 (5)	1.0 (1)	0.1 (6)	...	.....	0.01 (5)	1.0 (1)	0.1 (6)
40	17 mo.	No	.....	0.01 (2)	.....	0.5 (4)	...	.....	0.01 (2)	.....	0.1 (4)
41	13 mo.	Yes	.....	.....	.....	0.1 (3)	No	.....	.....	.....	0.01 (3)
42	3 yr.	...	.....	.....	.....	.....	...	.....	.....	.....	.....

sidered a part of the basic immunization, and a stimulating injection any time later produces a still higher level of antitoxin as will be shown later.

**B. Effect of Stimulating or Secondary Injection of Tetanus Toxoid.**—In table 3 are grouped observations on those children whose primary immunization was made up of two injections of 1 cc. of the combined toxoids and who received a stimulating or secondary injection of 1 cc. of the combined toxoids or 0.5 cc. of

0.2 unit one week after the stimulating injection, the others having titers of at least 1 unit and 1 as high as 35 units. Even though the response of antitoxin may be low after the second injection, there is good response after the stimulating inoculation, as was illustrated in a certain child. Before the first injection in this child and one and three months after the second injection no antitoxin was present in the lowest dilution for which antitoxin was titrated, i. e., less than 0.003 unit.



Ten months after the second injection his serum contained 0.01 unit of antitoxin. Within seven days after the stimulating injection 2 units of antitoxin per cubic centimeter of serum was present. As after the second injection, there again occurred a decrease in antitoxin,

as their primary immunization and who then received 0.5 cc. of tetanus toxoid one to eleven months later as a stimulating injection. There was again a rapid production of antitoxin. The average level of antitoxin was 6.78 units by the fourteenth day. This was higher

TABLE 3.—*Response to Stimulating Dose Following Two Primary Injections of Combined Alum Precipitated Diphtheria and Tetanus Toxoids*

Patient	Age	Allergy Present	Tetanus Potency			Stimulating Dose After Second Inoculation (Months)	Diphtheria Potency				
			After Second Inoculation (Months)	After Stimulating Dose			Had Previous Diphtheria Immunization	After Second Inoculation (Months)	After Stimulating Dose		
				(Weeks)	(Months)				(Weeks)	(Months)	
1	1 yr.	No	0.2 (3)	.....	1.0 (7)	Combined	(3)	...	0.01 (3)	.....	0.1 (7)
2	1 yr.	Yes	0.2 (1)	.....	0.1 (8) 0.01(21)	Combined	(1)	...	0.1 (1)	.....	0.1 (8) 0.1 (21)
3	5 yr.	No	0.2 (11)	5.0 (1)	0.2 (10)	Tetanus 0.5 cc. (11)		Diphtheria	0.1 (11)	0.1 (1)	0.1 (10)
4	8 yr.	No	0.2 (11)	2.0 (1)	0.2 (10)	Tetanus 0.5 cc. (11)		No	0.1 (11)	0.01 (1)	.....
5	8 yr.	No	0.0 (12)	2.0 (1)	.....	Tetanus 0.5 cc. (12)		...	1.0 (12)	2.0 (1)	.....
6	5 yr.	Yes	1.0 (3)	2.0 (1)	0.2 (12)	Tetanus 0.5 cc. (3)		Yes	0.1 (3)	2.0 (1)	0.1 (12)
7	5 yr.	Yes	0.2 (3)	5.0 (2)	0.2 (12)	Tetanus 0.5 cc. (3)		Yes	0.1 (3)	0.1 (2)	0.01(12)
8	10 mo.	No	0.5 (2)	.....	5.0 (1) 0.5 (6) 0.2 (17)	Combined	(2)	No	1.0 (2)	.....	1.0 (1) 0.1 (6) 0.1 (17)
9	4 yr.	No	0.1 (10)	1.0 (1)	.....	Combined	(10)	No	1.0 (10)	5.0 (1)	.....
10	4 yr.	No	0.2 (3)	5.0 (1)	0.5 (11)	Combined	(3)	No	0.1 (3)	5.0 (1)	0.1 (11)
11	4 mo.	No	0.5 (3)	2.0 (2)	0.5 (9)	Tetanus 0.5 cc. (3)		No	0.1 (3)	0.1 (2)	0.1 (9)
12	4 yr.	No	0.1 (3)	2.0 (1)	0.1 (11)	Tetanus 0.5 cc. (3)		Schick negative	0.1 (3)	1.0 (1)	0.1 (11)
13	4 yr.	No	0.1 (3)	5.0 (1)	.....	Combined	(3)	No	1.0 (3)	5.0 (1)	.....
14	2 yr.	No	0.5 (3)	1.0 (1)	0.2 (9)	Tetanus 0.5 cc. (3)		No	5.0 (3)	5.0 (1)	1.0 (9)
15	2 yr.	...	2.0 (3)	1.0 (1)	0.5 (8)	Tetanus 0.5 cc. (3)		...	0.1 (3)	0.1 (1)	0.01 (8)
16	2 yr.	Yes	.....	2.0 (1)	0.2 (10)	Tetanus 0.5 cc. (1)		...	.....	1.0 (1)	1.0 (10)
17	17 mo.	No	1.0 (3)	5.0 (1)	1.0 (11)	Combined	(3)	...	0.1 (3)	2.0 (1)	0.1 (11)
18	4 yr.	No	0.5 (2)	0.2 (1)	0.1 (7) 0.1 (12)	Tetanus 0.5 cc. (2)		No	0.1 (2)	0.1 (1)	0.1 (7)
19	17 mo.	No	2.0 (2)	5.0 (1)	0.5 (7) 0.2 (12)	Combined	(2)	No	0.1 (2)	2.0 (1)	0.1 (7) 0.1 (12)
20	2 yr.	No	0.5 (3)	2.0 (1)	0.5 (5) 0.2 (17)	Tetanus 0.5 cc. (3)		No	1.0 (3)	1.0 (1)	0.1 (3) 0.1 (17)
21	3 yr.	No	0.2 (9)	2.0 (1)	.....	Tetanus 0.5 cc. (9)		Yes	0.1 (9)	1.0 (1)	.....
22	16 mo.	No	.....	5.0 (1)	0.5 (12)	Combined	(3)	...	.....	5.0 (1)	5.0 (12)
23	2 yr.	No	0.5 (3)	2.0 (1)	0.1 (12)	Combined	(3)	No	0.1 (3)	2.0 (1)	0.1 (12)
24	2 yr.	No	0.5 (5)	1.0 (1)	0.2 (12)	Tetanus 0.5 cc. (5)		No	0.01 (5)	0.1 (1)	0.01(12)
25	20 mo.	No	0.1 (6)	2.0 (1)	0.2 (7)	Tetanus 0.5 cc. (6)		No	0.01 (6)	0.01 (1)	0.01 (7)
26	3 yr.	No	0.2 (6)	2.0 (1)	0.2 (5)	Tetanus 0.5 cc. (6)		No	0.1 (6)	0.1 (1)	0.1 (5)
27	11 mo.	No	0.1 (6)	2.0 (1)	0.01(12)	Tetanus 0.5 cc. (6)		No	0.01 (6)	0.01 (1)	0.01(12)
28	1 yr.	Yes	0.5 (3)	2.0 (1)	0.5 (6)	Tetanus 0.5 cc. (3)		No	0.1 (3)	0.1 (1)	0.01 (6)
29	17 mo.	No	0.5 (3)	5.0 (2)	2.0 (5)	Tetanus 0.5 cc. (3)		Yes	2.0 (3)	1.0 (2)	2.0 (5)
30	10 mo.	Yes	0.2 (6)	2.0 (1)	0.5 (11)	Combined	(6)	No	0.1 (6)	1.0 (1)	0.1 (11)
31	11 mo.	No	0.01 (7)	2.0 (1)	.....	Combined	(7)	No	0.1 (7)	1.0 (1)	.....
32	18 mo.	No	1.0 (3)	1.0 (3)	0.2 (9)	Combined 0.5 cc.(3)		No	0.01 (3)	0.1 (3)	0.01 (9)
33	11 mo.	No	1.0 (3)	.....	1.0 (3) 1.0 (10)	Combined	(3)	No	0.1 (3)	.....	0.1 (3) 1.0 (10)
34	10 mo.	Yes	.....	5.0 (1)	0.2 (12)	Combined	(1)	...	.....	5.0 (1)	0.1 (12)
35	18 mo.	No	0.5 (10)	5.0 (1)	.....	Tetanus 0.5 cc. (10)		No	0.1 (10)	0.1 (1)	.....
36	17 mo.	Yes	0.5 (6)	10.0 (1)	.....	Tetanus 0.5 cc. (6)		No	2.0 (6)	1.0 (1)	.....
37	15 mo.	No	0.5 (4)	2.0 (1)	0.2 (6)	Tetanus 0.5 cc. (4)		...	0.1 (4)	0.1 (1)	0.1 (6)
38	15 mo.	No	0.5 (4)	1.0 (1)	0.1 (6)	Tetanus 0.5 cc. (4)		...	0.1 (4)	0.1 (1)	0.01 (6)
39	13 mo.	Yes	1.0 (3)	2.0 (2)	0.5 (8)	Tetanus 0.5 cc. (2)		No	0.1 (3)	0.1 (2)	0.1 (8)
40	15 mo.	No	0.1 (4)	15.0 (2)	2.0 (6) 1.0 (10)	Tetanus 0.5 cc. (4)		...	0.1 (4)	0.1 (2)	0.1 (6) 0.1 (10)
41	1 yr.	Yes	0.5 (1)	1.0 (1)	0.2 (14)	Tetanus 0.5 cc. (1)		No	1.0 (1)	0.1 (1)	0.1 (14)
42	1 yr.	Yes	1.0 (1)	1.0 (1)	0.1 (12)	Combined	(1)	No	0.1 (1)	0.1 (1)	0.01(12)
43	18 mo.	No	0.5 (2)	.....	1.0 (2) 0.2 (9)	Tetanus 0.5 cc. (2)		No	0.1 (2)	.....	0.1 (2) 0.1 (9)
44	10 mo.	No	1.0 (1)	2.0 (2)	0.1 (12)	Tetanus 0.5 cc. (1)		No	0.1 (1)	1.0 (2)	0.1 (12)
45	18 mo.	No	.....	2.0 (1)	.....	Tetanus 0.5 cc. (1)		...	.....	0.1 (1)	.....
46	18 mo.	Yes	0.5 (1)	5.0 (1)	0.5 (10)	Tetanus 0.5 cc. (1)		No	2.0 (1)	1.0 (1)	0.01(10)
47	3 yr.	No	0.2 (1)	2.0 (3)	0.2 (10)	Combined	(1)	No	1.0 (1)	1.0 (3)	0.1 (10)
48	17 mo.	No	2.0 (2)	.....	0.5 (5)	Tetanus 0.5 cc. (8)		No	0.1 (2)	.....	0.01 (5)
49	15 mo.	No	1.0 (2)	.....	0.1 (10)	Tetanus 0.5 cc. (2)		...	0.1 (2)	.....	0.01(10)
50	11 mo.	No	2.0 (10)	.....	5.0 (3)	Tetanus 0.5 cc. (10)		...	0.1 (10)	.....	1.0 (3)
51	10 mo.	Yes	0.01(11)	5.0 (2)	.....	Tetanus 0.5 cc. (11)		No	0.1 (11)	2.0 (2)	.....

the average titer between the first and sixth month being 1.42 units and then a rapid decrease to 0.33 unit taking place by the end of the year. It is to be noted, however, that only one titer fell as low as 0.01 unit in a year, with all other titers 0.1 unit or more.

Table 4 includes observations on those children who received two doses of 0.5 cc. of the combined toxoids

than the average in the preceding group because of several high titers in such a small group. The usual decrease in levels of antitoxin occurred with an average of 1.6 units by the sixth month and 0.15 unit by the end of the year.

It is evident from the foregoing figures that a high, rapid response of antitoxin occurs in children immunized



against tetanus after a stimulating injection of tetanus toxoid or the combined toxoid. The immediate response of antitoxin was as good in those children immunized with doses of 0.5 cc. of the combined toxoids as it was when doses of 1 cc. were used. Although these children received their stimulating injections only one to twelve months after being immunized, our results with intervals up to two years have been the same in a few children so inoculated. In fact, the longer intervals, in table 4, seem to account for the average level of antitoxin being higher than it is in table 3.

#### INFLUENCE OF THE INTERVAL BETWEEN INJECTIONS

Jones<sup>4</sup> has pointed out that by increasing the interval between injections for immunization against diphtheria a better immunity will result. This seems to hold true for immunization against tetanus. In chart 2 are given

#### NUMBER OF INJECTIONS FOR PRIMARY IMMUNIZATION

We were interested in knowing whether a series of three injections had any advantage over a series of two injections to establish the primary immunization. In chart 3 are given the average titers of antitoxin in the blood serum of two groups, one given two and the other three injections. When three injections were used the initial response of antitoxin was no higher than when two injections were used, but the levels remained somewhat higher. The average titer of antitoxin was 3.5 units within one month in both groups. In the group given three injections at the end of six months the average was 0.9 unit and by the twentieth month it was 0.35 unit, as compared to 0.25 unit and 0.23 unit respectively in the group given two injections. It is apparent that three injections are superior to two injections for primary immunization when the height of the response

TABLE 4.—*Stimulating Dose with 0.5 Cc. Alum Precipitated Tetanus Toxoid After Two Doses (0.5 Cc.) of Combined Alum Precipitated Diphtheria and Tetanus Toxoids*

Patient	Age	Allergy Present	Tetanus Toxoid Second Inoculation (Months)	Tetanus Toxoid Stimulating Dose, Months After Second Inoculation	Tetanus After Stimulating Dose (Weeks)	Tetanus After Stimulating Dose (Months)	Diphtheria			
							Had Previous Diphtheria Immunization	After Second Inoculation (Months)	After Stimulating Dose (Weeks)	After Stimulating Dose (Months)
1	2 yr.	No	0.5 (3)	3	2.0 (1)	0.2 (6)	No	1.0 (3)	1.0 (1)	0.1 (6)
2	2 yr.	No	0.1 (6)	6	1.0 (1)	.....	No	0.01 (6)	0.1 (1)	.....
3	2 yr.	Yes	0.1 (5)	5	.....	0.2 (5)	No	0.01 (5)	.....	0.01 (5)
4	22 mo.	No	0.2 (10)	10	5.0 (1)	.....	No	0.1 (10)	0.01 (1)	.....
5	3 yr.	No	0.01 (8)	8	2.0 (1)	0.2 (12)	No	0.1 (8)	1.0 (2)	1.0 (12)
6	9 mo.	Yes	0.01 (8)	8	25.0 (1)	.....	No	0.01 (8)	2.0 (1)	.....
7	10 mo.	No	0.01 (8)	8	25.0 (1)	.....	No	0.01 (8)	0.1 (1)	.....
8	14 mo.	No	0.1 (11)	11	15.0 (2)	.....	No	0.1 (11)	10.0 (2)	.....
9	13 mo.	No	1.0 (3)	3	0.5 (1)	0.1 (10)	No	0.1 (3)	0.1 (1)	0.1 (10)
10	11 mo.	No	0.2 (3)	3	2.0 (1)	0.1 (12)	No	0.1 (3)	0.1 (1)	0.01 (12)
11	11 mo.	No	0.5 (3)	3	1.0 (1)	0.2 (12)	No	0.1 (3)	0.1 (1)	0.1 (12)
12	8 mo.	No	0.2 (3)	3	5.0 (1)	0.2 (6)	No	0.01 (3)	1.0 (1)	0.1 (6)
						0.2 (8)				0.1 (8)
13	1 yr.	No	0.01 (11)	11	1.0 (1)	.....	No	0.1 (11)	0.1 (1)	.....
14	2 yr.	Yes	0.1 (6)	6	.....	1.0 (1)	No	0.01 (6)	.....	1.0 (1)
15	1 yr.	No	0.2 (12)	12	10.0 (1)	.....	...	0.01 (12)	2.0 (1)	.....
16	10 yr.	Yes	0.01 (1)	1	0.5 (1)	.....	No	0.01 (1)	0.1 (1)	.....
17	13 mo.	Yes	0.5 (4)	4	.....	5.0 (1)	...	0.1 (4)	.....	5.0 (1)
18	2 yr.	...	0.1 (3)	3	.....	0.1 (9)	...	0.1 (3)	.....	0.1 (9)
19	2 yr.	...	0.1 (3)	3	.....	0.1 (9)	...	0.01 (3)	.....	0.01 (9)

the levels of antitoxin following an interval of one to two months and those with an interval of six months or more between the first and second injections of the primary immunization. With the longer interval the immediate response of antitoxin is much higher, averaging nearly 20 units as compared to about 5 units for the shorter interval. There is then a rapid decrease in levels of antitoxin, so that by the end of a year the levels in the long and the short intervals are approximately the same.

This same difference in response of antitoxin has been found to hold true when a stimulating or secondary injection is given. The average titer of antitoxin two weeks after a stimulating injection was only 2.6 units per cubic centimeter of serum when intervals up to three months were used, but when the interval was six months to one year the average titer was 6.88 units. By the end of a year the antitoxin content of the serum approached approximately the same level, irrespective of the interval between injections. It would seem that an interval of three or more months between the injections of the primary immunization would be desirable, although an adequate immunity does follow intervals of one to two months.

of antitoxin is considered. There were no low titers in the group given three injections such as are at times encountered with two injections, as may be seen in table 1.

The same type of curve is present when injections of 0.5 cc. of the combined toxoids are used (chart 4).

The only advantage of three injections is the establishment of a higher level of antitoxin for about six months. If three injections are to be used, doses of 0.5 cc. will give as good a response as two doses of 1 cc. With this method we have experienced no titers lower than 0.5 unit within three months of the third injection.

The stimulating injection given three months to one year after the primary immunization (both in the group given two and in that given three injections) produces a rapid and high response of antitoxin which decreases in six months to, and continues at about, the same level as that in the group given three injections (charts 3 and 4).

#### DURATION OF IMMUNITY

It has not been established how long the immunity developed by immunization against tetanus lasts. As yet there have been no cases of tetanus reported as occur-

ring in man or in horses immunized several years ago.<sup>18</sup> The number so immunized has been large when one considers that this procedure has been obligatory in the French army as just one group. Whether or not the basic immunity which develops from the primary immunization is sufficient for protection from the infec-

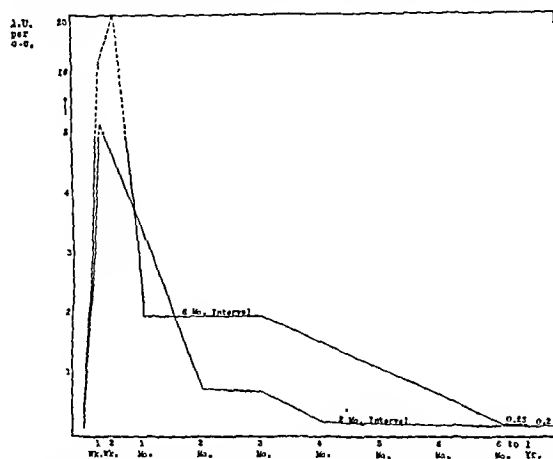


Chart 2.—Comparison of six month interval and two month interval between first and second injections of combined alum precipitated diphtheria and tetanus toxoids as to titers of tetanus antitoxin. A. U., antitoxin units.

tion, as it generally is in diphtheria, is not known. For that reason it is advisable at present to use stimulating doses of toxoid when an injury likely to be infected with tetanus spores occurs. Theoretically this should not be necessary, but only time will give the final answer. In chart 5 are given curves for the average titers of antitoxin as we have found them in our group of children over a period of two years. By the end of two years after the primary immunization several titers were as low as 0.01 unit (one decreasing to 0.003 unit), while after a third injection no titers decreased below 0.1 unit except two at the 0.01 unit level. There was little if any change during the second year. No child has failed to have a rapid response of antitoxin at any time to a stimulating or secondary injection of toxoid.

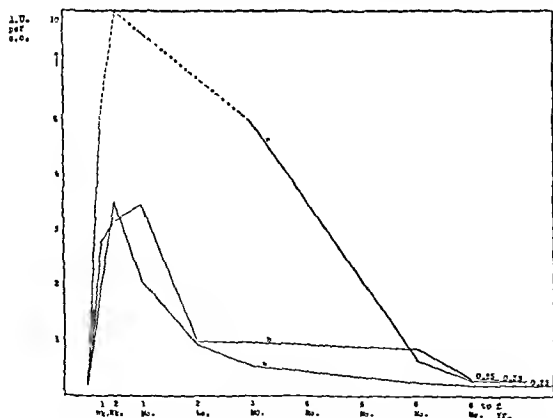


Chart 3.—Titers of tetanus antitoxin after primary immunization with doses of 1 cc. of combined toxoids and stimulating injection: a, two injections one to three months apart; b, three injections one to three months apart; c, stimulating injection more than three months after primary immunization.

#### IMMUNITY AGAINST DIPHTHERIA

Schick tests were not done on any of the children to eliminate the stimulation to the production of antitoxin which might occur from the small doses of toxin. The

titration for antitoxin was done on the child's blood serum by the rabbit skin test method. The response to the combined toxoids varied according to whether some antitoxin was previously present either from natural immunity or from previous immunization to diphtheria. The titers of the blood for one group of children immunized are given in table 1. Three months after the first injection of the combined toxoids 19 per cent of the children still had 0.002 unit or less of antitoxin per cubic centimeter of serum. This would seem to corroborate the opinion that one injection of toxoid is not sufficient for satisfactory immunity. When appreciable amounts of antitoxin had been previously present, titers from 1 to 5 units were found. In the others the usual titers were between 0.01 and 0.1 unit per cubic centimeter of serum.

After the second injection there was a rapid rise in the titers within two weeks. In only 2 children of all those to whom we have given the injections was there some failure in the production of antitoxin. In 1, 0.002 unit of antitoxin was present two weeks after the second injection. Unfortunately this child failed to return for further study. In another child not included in the tables no antitoxin was present in the lowest dilution for which his serum was titrated (less than 0.002 unit) before immunization, one and three months after the

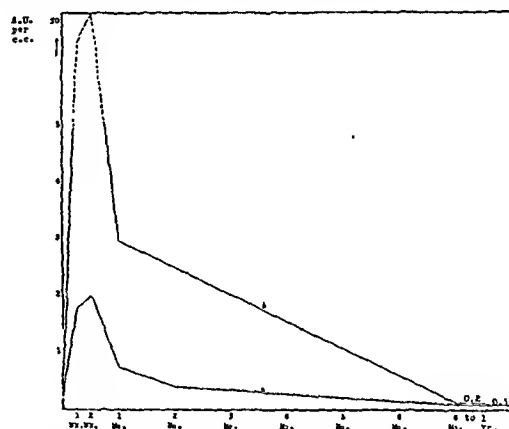


Chart 4.—Titers of tetanus antitoxin after primary immunization with doses of 0.5 cc. of combined toxoids and stimulating injection: a, primary immunization (average of two and three injections); b, stimulating injection.

first injection and twelve months after the second injection. He has as yet not received a third injection. This child undoubtedly was one of those persons resistant to the production of antitoxin, because there was also a complete failure of response of tetanus antitoxin over the same period. After the rapid increase of antitoxin immediately following the second injection there occurs a fall in the level of antitoxin to 0.01 to 0.1 unit by the end of two years in many children. One level decreased to 0.002 unit in twelve months. This decrease in diphtheria antitoxin is more rapid than that of tetanus antitoxin, and the levels are not nearly so high at any time.

When injection of the combined toxoids is given in doses of 0.5 cc., a satisfactory response of antitoxin occurs (table 2). In fact, the titers of antitoxin are comparable to those resulting from doses of 1 cc. of the combined toxoids.

In those children receiving a third dose of the combined toxoids one to several months after the second injection there was again a rapid rise in the titer of antitoxin (table 3), the levels of antitoxin varying from 0.1 to 5 units. Again followed a decrease in the titers,

so that by the end of a year many of these were as low as 0.01 to 0.1 unit. There is usually no response of diphtheria antitoxin when only tetanus toxoid is used for the third injection. We cannot account for the occasional variation in titers of diphtheria antitoxin which occurs after the injections of tetanus toxoid.

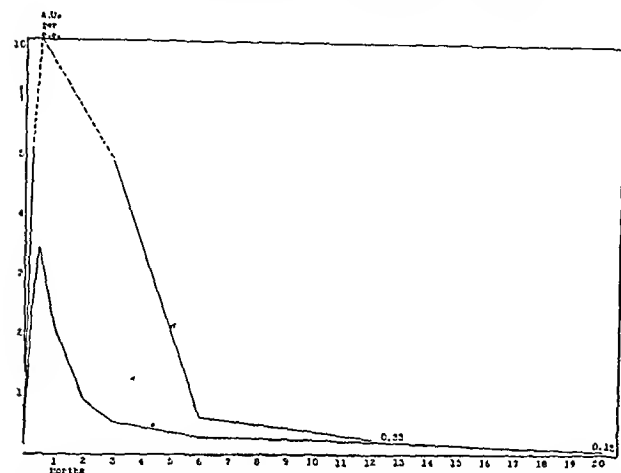


Chart 5.—Duration of immunity to tetanus following primary immunization and stimulating injection: *a*, primary immunization (average of two and three injections); *b*, stimulating injection.

If one increases the interval between the first and second injections from three to six months or more there is a greater immediate response of antitoxin, as occurs with immunization against tetanus. There is, however, a more rapid fall in diphtheria antitoxin, so that after the second month the average level of antitoxin is the same irrespective of the interval (chart 6).

The duration of immunity, as evidenced by the presence of antitoxin, follows about the same curve as for tetanus antitoxin. There was a fairly rapid decrease in antitoxin up to the sixth month, after which the usual titers remained between the levels of 0.01 to 0.1 unit for the two years for which we have checked them (chart 7).

*Immunity Response According to Age.*—There was little difference in the immunity response according to age. The infants under 18 months of age had a slightly higher average response of antitoxin than the other chil-

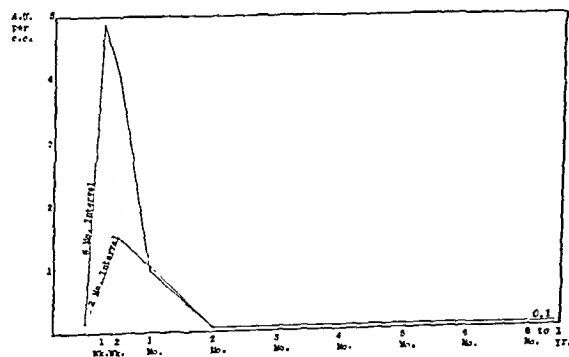


Chart 6.—Comparison of six month interval and two month interval between first and second injections of combined alum precipitated diphtheria and tetanus toxoids as to titers of diphtheria antitoxin.

dren up to 5 years of age. This was true after the initial immunization as well as after a stimulating or secondary injection. The titers we obtained were approximately the same as those found by McBryde in his group of children, but they definitely ran much higher than those found in adults.

*Immunity Response of Allergic and Nonallergic Children.*—When the immunity response of allergic children was compared to that of nonallergic children it was found that the levels of antitoxin averaged moderately higher in the latter group.

*Immunization with Combined Diphtheria and Tetanus Toxoids.*—The combined toxoids always produced a much higher initial titer of tetanus antitoxin than did tetanus toxoid alone, which was used on a small group of children. Six months or more after inoculation the titers produced by the two products averaged about the same. Both always produced protective levels when compared to 1,500 units of tetanus antitoxin. Titers of diphtheria antitoxin with combined immunization were as high as if not higher than those reported from immunization against diphtheria alone. Furthermore, there were fewer levels of antitoxin below those required for Schick immunity with the combined toxoids. Tetanus toxoid alone did not influence the level of diphtheria antitoxin in the serum.

#### REACTIONS

The reactions following the administration of combined diphtheria and tetanus toxoids are no different from those following the use of alum precipitated diphtheria toxoid. There is stinging and burning at the site of injection which lasts for several minutes, as it does

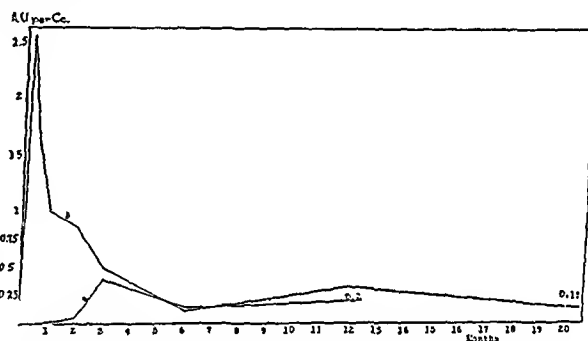


Chart 7.—Titers of diphtheria antitoxin following first and second injections of combined alum precipitated diphtheria and tetanus toxoids: *a*, one injection; *b*, two injections.

also with plain toxoid. There is usually a hard nodule present which may persist for several weeks as it decreases in size. Occasionally the inoculated area may become reddened for about twenty-four hours, and some tenderness may also be present. In several hundred inoculations that we have done we have never encountered an abscess or an area which gave the appearance of the formation of an abscess. In a few instances there was a mild general reaction, with a low fever and mild malaise for about twelve hours. The reactions were much fewer and less violent than those we have encountered in immunization against pertussis. They were about the same as those encountered when unmodified diphtheria toxoid was used.

In 1 of the 300 children to whom we had given either tetanus toxoid or the combined diphtheria and tetanus toxoids a rash developed after the first inoculation which from the mother's description we felt was moderately severe urticaria. It developed within a few hours of the injection and lasted for several hours. There was no recurrence after the second injection. We saw another child in whom urticaria developed, a physician's child who had an allergy to pollen. After the first injection given by the father a few urticarial lesions appeared. Three months later, immediately after the

second injection, moderately severe urticaria again developed. This responded promptly to an injection of epinephrine. We have encountered no other symptoms of allergy, although about half of the children had some form of allergy. Many of the infants had severe eczema when the injections were given. Many of the older children had hay fever and asthma at the time they were inoculated. Some were receiving injections of antigens for their allergies during the same period in which they were being immunized. In none of these children was there any aggravation of their symptoms of allergy.

We gave injections also to some children with infections of the upper part of the respiratory tract with and without fever. In 2 instances in which children had temperatures of 102 to 103 F. the temperatures rose to 105 F. This may or may not have been due to the inoculation. Both recovered from their infections in a normal manner. We do feel from this experience that it is not advisable, without definite indication, to give injections of toxoid when fever is present.

#### INTRADERMAL IMMUNIZATION

We are at present using intradermal injections, at intervals of from one to three months, of the combined toxoids or of tetanus toxoid in a group of 32 children in doses of 0.05 to 0.1 cc. This group has as yet not been studied long enough for us to draw final conclusions as to the efficacy of this method of immunization. From two weeks to nine months after the second injection the blood serum of 9 of the children did not contain any tetanus antitoxin in the lowest dilution for which it was titrated, which was less than 0.003 unit per cubic centimeter, 6 had a titer of only 0.003 unit and the rest had titers of 0.01 to 0.1 unit with only 1 as high as 0.5 unit. Two children were given a third injection, and within three weeks the titer of antitoxin had increased from 0.01 to 0.1 unit in 1 and from 0.1 to 0.5 unit in the other. Two intradermal injections of the toxoids produce a low level of antitoxin. A subsequent report on this procedure will be made.

#### COMMENT

There is a great variation in the responses of individual children to tetanus and diphtheria toxoids as measured by the level of antitoxin in the blood serum. For tetanus antitoxin the levels vary from less than 0.003 to 35 units per cubic centimeter of serum, and for diphtheria antitoxin they vary from less than 0.002 to 15 units per cubic centimeter. There is no relationship in the amount of tetanus antitoxin as compared to the amount of diphtheria antitoxin which will develop in the same person from injections of toxoid.

A few persons seemed to respond poorly to injections of toxoid when the response was measured by the production of antitoxin. In this group of infants and children 1 child failed in the production of both tetanus and diphtheria antitoxin. Before injection of the toxoids the titer of diphtheria antitoxin was less than 0.002 unit, being the same after the first injection and also two weeks and twelve months after the third injection. The titer of tetanus antitoxin at these same periods was less than 0.003 unit. One child failed to have more than 0.003 unit of tetanus antitoxin three months after the second injection, although the response of diphtheria antitoxin was adequate. Another child, while having an adequate response of tetanus antitoxin developed only 0.002 unit of diphtheria antitoxin within

two weeks after the second injection. We cannot classify these last patients, as failing to respond, because it was not possible to get their reaction to a third injection.

It is apparent from this study that intervals of three to six months between injections result in a better immunity response than do shorter intervals.

Two injections of 1 cc. of combined diphtheria and tetanus toxoids produce an adequate basic immunity as measured by the response of antitoxin. There was one possible failure for both diphtheria and tetanus toxoids and one other each for diphtheria and for tetanus. Two injections of 0.5 cc. of the combined toxoids also produced an adequate immunity in a small series with no apparent failures. In this group some were given a series of three injections with a response similar to that of the group receiving two injections of 1 cc. This basic immunity as measured by the response of antitoxin seemed to be adequate for several months, especially when there were intervals of three or more months between injections.

A stimulating or secondary injection of tetanus toxoid or the combined toxoids always produced a high titer of tetanus antitoxin which was much superior to that following the giving of 1,500 units of antitoxin both as to amount and as to the length of time high titers were present in the blood stream.

From this study it would seem that the combined immunization against tetanus and diphtheria of infants and children is both practical and possible. The apparent failures of immunization against tetanus gaged by the production of antitoxin were no more frequent than were those experienced in immunization against diphtheria. Because of the uncertainty which is still present as to the response of children immunized against tetanus to an infection with tetanus spores, it is advisable to give a stimulating dose of tetanus toxoid when a suggestive injury occurs.

For the child who has already been immunized against diphtheria and who is to be immunized against tetanus it would seem advisable but not necessary to give the first injection of the combined toxoids and the second injection of tetanus toxoid alone, or, if one so desires, the combined toxoids can be used for both injections.

#### CONCLUSIONS

1. Combined immunization against tetanus and diphtheria of infants and young children is possible, as evidenced by the antitoxin content of the blood serum.

2. A stimulating dose of tetanus toxoid given to an immunized child causes a rapid and high response of antitoxin.

3. In the light of our present knowledge there are no more failures in immunization against tetanus than there are in immunization against diphtheria.

4. The duration of immunity to tetanus as measured by the level of antitoxin in the blood serum was as good as the immunity to diphtheria during the two years of observation.

5. Two injections of 1 cc. of the combined toxoids or three injections of 0.5 cc. produce an adequate basic immunity. The use of three injections of 1 cc. for basic immunity, although producing higher levels of antitoxin, does not seem to be necessary.

6. Intervals of three months or more between injections enhance the response of antitoxin.

7. Combined immunization against tetanus and diphtheria would seem as practical as immunization against diphtheria alone.

8. Reactions to injections of combined tetanus and diphtheria toxoid are no more frequent or severe than they are with diphtheria toxoid.

9. Prophylactic injections of tetanus antitoxin produce a protective level of antitoxin for only a few weeks. This level is not as high as that after immunization with tetanus toxoid nor does it last nearly as long.

10. It is apparently safe to administer tetanus and diphtheria toxoids to allergic children. Sensitization to the toxoids is rare. This is in contrast to the antitoxins used for passive immunity.

11. In the light of our present knowledge it would seem safer to give an immunized person a stimulating dose of tetanus toxoid after an injury involving probable infection with tetanus spores.

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## CHEMOTHERAPY VERSUS COMBINED CHEMOTHERAPY AND SERUM

IN THE TREATMENT OF PNEUMONIA  
A STUDY OF 607 ALTERNATED CASES

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The universal acceptance of the value of sulfonamide therapy in pneumonia has left the role of serum as the major current problem in the treatment of this disease. Will the use of serum combined with drug reduce still further the fatality rate? Will it cause a more rapid subsidence of the acute infectious process? These problems have been studied at Bellevue Hospital by using the alternate case method. Since February 1939, all pneumonia patients entering the wards of the First, Second and Fourth medical divisions have been alternated within the pneumococcus types between sulfonamide therapy alone and combined drug and serum therapy. In the present study we are reporting the results up to Jan. 1, 1941 in a series comprising 607 patients thus alternated.

### METHOD

As soon as the clinical diagnosis of pneumonia was made, samples of blood and sputum were collected for bacteriologic study. The patient was then immediately placed on sulfonamide therapy without waiting for the results of typing. When the pneumococcus type was obtained, alternate patients in each type were placed in either the drug alone or drug plus serum group. If the patient fell in the drug plus serum group he was given, in addition to the drug, concentrated antipneumococcus rabbit serum. This was administered as soon as the specific type was obtained except when striking

clinical improvement already had occurred and serum no longer would be of value. These patients, however, were left in the "drug-plus-serum" group because to remove them would create a statistical error in favor of the drug-alone series. The first therapeutic dosage of serum was usually 100,000 units in uncomplicated cases and 200,000 units or more for known bacteremic or seriously ill patients. This dosage was repeated when necessary. Six patients who would have been due for serum survived less than twenty-four hours and died before typing was completed. These patients, therefore, received no serum but were necessarily counted in the serum group, it being one of the inherent disadvantages of serum therapy that there usually is some delay before serum can be started even under ideal circumstances. With the exception of these six twenty-four hour deaths, all other patients in the serum group who died received serum.

Several different sulfonamide drugs were used during the course of this study: sulfapyridine, dextrose-sulfapyridine, sodium sulfapyridine, sulfathiazole, sulfamethylthiazole and sulfadiazine. When a new drug was introduced, one or more whole wards were shifted from one drug to the other, and all patients entering these wards were treated with the new drug without interfering with the alternation of cases between the drug-alone and the combined therapy groups. There was an occasional failure of response, and occasionally a maintenance dose higher than 1 Gm. every four hours was used. A few patients received sodium sulfapyridine intravenously either to obtain a more rapid absorption or to procure a higher blood concentration of the drug.

Other forms of treatment including oxygen therapy, procedures for maintaining an adequate fluid intake, sedation and various symptomatic measures were used as indicated in both groups of cases.

This study included cases of both lobar pneumonia and bronchopneumonia. No patients were excluded except those with atypical congestive bronchopneumonia terminating some otherwise fatal disease such as carcinoma or heart disease. All other cases of pneumonia were included: systemic disease, no matter how serious, did not disqualify patients. A complete bacteriologic study was carried out in all cases; throat swab cultures were made when sputum was not obtainable; typing was repeated in all of the higher types and whenever the results were not conclusive; typing from the peritoneal exudate and from the brain of the mouse was used to supplement and confirm the findings in every case; admission blood cultures were always procured and repeated when indicated; chest fluid, or any other specimen from a localized process obtainable either ante mortem or post mortem was sent to the laboratory for study. In addition almost every patient had at least one roentgen examination, blood counts, urinalyses and blood chemistry determinations, particularly the sulfonamide drug concentration.

### COMPARATIVE EFFECT ON THE MORTALITY RATE

The effect of the two modes of therapy on the fatality rate is shown in table 1. Of 306 patients treated with chemotherapy alone, 34 (11.1 per cent) died. Of 301 patients treated with chemotherapy plus serum, 44 (14.6 per cent) died. However, if patients dying within twenty-four hours of the start of treatment are excluded, the mortality rates become nearly equal, 9.3 per cent for the drug group and 9.8 per cent for the drug-plus-serum group. It is noteworthy that even in types I, II,

This investigation has been conducted under a grant of the Josiah Macy Jr. Foundation. The serum and drugs used were supplied by the Lederle Laboratories, Inc., and in part by the Winthrop Chemical Company.

From the First (Columbia), Second (Cornell) and Fourth Medical Divisions, Bellevue Hospital, and the Departments of Medicine of the Columbia University College of Physicians and Surgeons and Cornell University Medical College, and a Committee for Pneumonia Investigation consisting of Drs. Russell L. Cecil, I. Ogden Woodruff, Asa L. Lincoln and Charles H. Nammack (the latter three, directors of the First, Second and Fourth Medical Divisions respectively) and the authors.

V and VII, in which the value of serum is best established, the fatality rates were not significantly lower in any of the drug-and-serum groups.

#### COMPARATIVE EFFECT IN BACTEREMIC PATIENTS

In the drug-only group there were 61 bacteremic patients, of whom 20 (32.8 per cent) died, four within twenty-four hours. In the drug-and-serum group, 64 were bacteremic and 29 (45.3 per cent) died, 14 within twenty-four hours. Excluding the twenty-four hour deaths, the mortality rate in the drug group was 28.1 per cent and in the drug-and-serum group 30.0 per cent.

The incidence of bacteremia in this study is 20.6 per cent. This is lower than the incidence in previously reported Bellevue series, because under effective sulfonamide therapy patients rarely develop bacteremia after treatment is commenced. In this series we encountered

Of the 158 early cases in which drug-alone treatment was employed there were 7 deaths (4.4 per cent); of the 146 early cases (one twenty-four hour death excluded) in the drug-and-serum group there were 10 deaths (6.8 per cent).

TABLE 2.—*Bacteremic Cases and Results by Types*

Type	Drug Only			Drug and Serum		
	Cases	Deaths	24 Hr. Deaths	Cases	Deaths	24 Hr. Deaths
I.....	16	5	1	14	6	3
II.....	13	4	1	12	7	2
III.....	5	2	1	8	4	2
IV.....	0	0	0	2	1	1
V.....	4	1	1	6	1	1
VI.....	0	0	0	0	0	0
VII.....	5	3	0	8	4	2
VIII.....	6	1	0	7	1	0
IX.....	2	1	0	0	0	0
X.....	0	0	0	0	0	0
XI.....	0	0	0	0	0	0
XII.....	1	0	0	0	0	0
XIII.....	0	0	0	0	0	0
XIV.....	1	0	0	2	2	1
XV.....	0	0	0	0	0	0
XVI.....	0	0	0	0	0	0
XVII.....	0	0	0	0	0	0
XVIII.....	1	1	0	2	0	0
XIX.....	1	1	0	0	0	0
XX.....	0	0	0	1	1	0
XXI.....	0	0	0	0	0	0
XXII.....	0	0	0	2	2	2
XXIII.....	0	0	0	..	..	..
XXIV.....	0	0	0	0	0	0
XXV.....	4	1	0	0	0	0
XXVI.....	1	0	0	0	0	0
XXVII.....	1	0	0	..	..	..
XXVIII.....	0	0	0	0	0	0
Total.....	61	20 (32.8%)	4	64	29 (45.3%)	14
Excluding 24 hr. deaths.....	57	16 (28.1%)		50	15 (30.0%)	

In the "late" group (omitting twenty-four hour deaths) there were 117 cases in the drug group with 14 deaths (12.0 per cent) and a total of 110 cases in the drug-and-serum group with 11 deaths (10.0 per cent). In the "uncertain" group (omitting twenty-four hour deaths) there were 26 in the drug group with 7 deaths (26.9 per cent) and 28 cases in the drug-and-serum group with 7 deaths (25.0 per cent). Combining the "late" and "uncertain" groups we have a total of 143 cases with 21 deaths (14.7 per cent) in the drug group and 138 cases with 18 deaths (13.0 per cent) in the drug-and-serum group. Thus it can be seen that the fatality rate in the patients treated early, whether by

TABLE 3.—*Results in Early Cases (First Three Days) Compared with Those in Late Cases and in Cases of Uncertain Duration*

	Cases	Total Deaths	Fatality Rate with 24 Hour Cases Excluded	
			24 Hour Deaths	
Early				
Drug only.....	158	7 (4.4%)	0	4.4%
Drug and serum.....	147	11 (7.5%)	1	6.8%
Late				
Drug only.....	122	19 (15.6%)	5	12.0%
Drug and serum.....	118	19 (16.1%)	8	10.0%
Uncertain				
Drug only.....	27	8 (29.6%)	1	26.9%
Drug and serum.....	33	14 (40.0%)	7	25.0%

drug alone or by drug and serum, was about one-half the fatality of the late and uncertain cases combined; this emphasizes anew the well known fact that early treatment is essential if the best results are to be obtained. The additional routine use of serum did not materially affect the outcome in the early, in the late or in the uncertain group.

TABLE 1.—*Distribution of Cases and Results by Types*

Type	Drug Only			Drug and Serum		
	Cases	Deaths	24 Hr. Deaths	Cases	Deaths	24 Hr. Deaths
I.....	49	6	1	51	9	3
II.....	49	4	1	55	10	3
III.....	31	4	1	32	8	3
IV.....	9	1	0	7	1	1
V.....	24	2	1	27	1	1
VI.....	4	0	0	6	0	0
VII.....	34	6	1	33	4	2
VIII.....	25	2	0	26	2	0
IX.....	3	1	0	2	0	0
X.....	5	1	0	5	0	0
XI.....	2	0	0	2	1	0
XII.....	2	0	0	3	0	0
XIII.....	5	0	0	1	0	0
XIV.....	8	1	0	6	2	1
XV.....	5	0	0	4	0	0
XVI.....	1	0	0	1	0	0
XVII.....	3	0	0	7	1	0
XVIII.....	3	2	0	6	0	0
XIX.....	8	1	0	5	0	0
XX.....	7	0	0	4	1	0
XXI.....	1	0	0	1	0	0
XXII.....	1	0	0	2	2	2
XXIII.....	1	0	0	..	..	..
XXIV.....	3	0	0	..	1	0
XXV.....	6	1	0	4	0	0
XXVI.....	1	0	0	3	0	0
XXVII.....	4	1	0	..	..	..
XXVIII.....	1	0	0	2	0	0
XXIX.....	1	0	0	..	..	..
XXX.....	1	0	0	2	1	0
XXXI.....	3	1	1	2	1	0
Total.....	306	34 (11.1%)	6	301	44 (14.6%)	16
Excluding 24 hr. deaths.....	300	28 (9.3%)		285	28 (9.8%)	

no patient whose blood culture was sterile on admission and became positive during treatment.

There were 4 bacteremic patients in this series whose plates showed innumerable colonies of pneumococci and who recovered. In the Bellevue experience in the pre-chemotherapeutic era, all such patients died. As it happened, these 4 patients were all in the drug-alone group, and each was treated with a different drug, viz. sulfapyridine, sulfathiazole, sulfamethylthiazole and sulfadiazine. It is remarkable that any patients with such severe infections should recover, and noteworthy that they were all in the drug-alone group.

#### RESULTS IN EARLY AND IN LATE CASES

In order to evaluate further the effect of the two modes of therapy, all cases were divided according to the duration of illness before treatment was begun. They were grouped into three classes: early (treatment started during the first three days), late (treatment begun on the fourth day or later) and uncertain (duration of illness not ascertainable). The last group for the most part comprised patients entering when moribund, or nearly so, and were consequently usually late cases. The results of treatment are given in table 3.



## COMPARATIVE EFFECTS ON RAPIDITY OF RECOVERY

It is not easy to judge the effect of the two modes of therapy on the rapidity of recovery. We have elected to estimate this by making composite temperature curves (charts 1 and 2) of the type I and of the type II cases in the two therapeutic groups in which survival

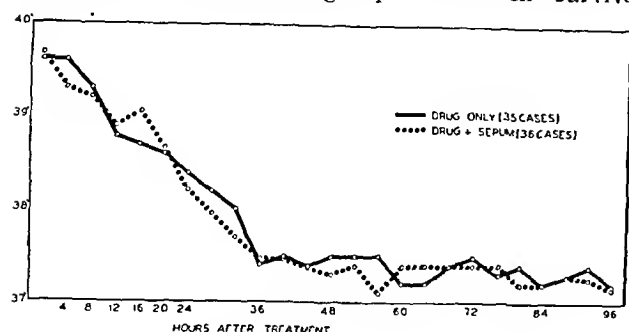


Chart 1.—Comparative temperature response in type I cases.

occurred. In these two types the effect of serum therapy has been most completely studied, and if differences in rapidity of response are to be found they should be apparent here. As can be seen, there is no significant difference in the two temperature curves for each type, nor could any consistent difference in the two therapeutic groups be noted clinically. The serum was given at varying intervals after the start of drug treatment, depending on the speed of typing but usually within the first twenty-four hours.

## AGE OF PATIENTS

The patients comprising this study were older, on the whole, than those in most other reported studies, the average age for the entire group being 49.3 years. The distribution by age is shown in table 4. The average age for the drug group was 49.2 years, for the drug-plus-serum group 49.3 years. There were no deaths in either group in patients under 30 years of age. Between 30 and 50 the fatality rate was 3.4 per cent in the drug group and 4.9 per cent in the drug-and-serum group. For patients 50 or more years of age, the fatality rate was 16.1 per cent in the drug group and 16.8 per cent in the drug-and-serum group.

## DRUG LEVELS AND AMOUNT OF SERUM USED

Blood level estimations were done frequently on most of the patients during the active stage of the disease.

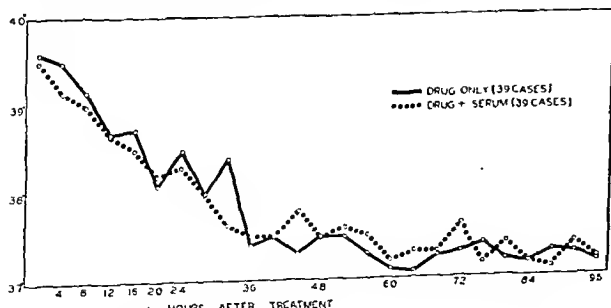


Chart 2.—Comparative temperature response in type II cases.

Our data are not complete enough, however, to allow us to draw any definite conclusions. In experimental infections in animals treated with sulfonamides, Marshall<sup>1</sup> has shown that the percentage of animals sur-

living depends on drug dosage and drug level, high doses and levels increasing the survival rate. It is probable that this applies to human cases of pneumonia also, but we are unable to state what constitutes the optimum blood level of drug. In practice the estimation of blood levels has been of value chiefly for those patients who have not responded satisfactorily or who have had impaired renal function. If failure of a patient to respond appears to be due to a low blood level, parenteral or increased oral administration of the drug can be used. An initial dose of 2 Gm. was used in all our cases. That a larger initial dose would have saved a substantially greater number of patients seems to us unlikely.

The amount of serum used varied from 80,000 to over 600,000 units; for patients who died but survived long enough to receive serum, the average dose was 260,000 units.

## RESULTS ACCORDING TO DRUG USED

There seemed to be no significant difference in the fatality rates for the different sulfonamide compounds used, although several of the compounds were not tried extensively enough to offer conclusive evidence on this point (table 5). All the compounds were potent remedies for pneumonia, although the dextrose-sulfapyridine solution used (10 per cent in 50 per cent dextrose

TABLE 4.—Distribution of Cases and Results by Age

Age	Drug Only				Drug and Serum			
	Cases	Deaths	24 Hour Deaths Excluded	Fatality Rate with 24 Hour Deaths	Cases	Deaths	24 Hour Deaths Excluded	Fatality Rate with 24 Hour Deaths
Under 30	33	0	0	0	32	0	0	0
30 to 50	118	4	0	3.4%	124	8	2	4.9%
50 and over	155	30	6	16.1%	145	36	14	16.8%
Total	306	34	6	9.3%	301	44	16	9.6%

given orally) was a little less efficient than the other drugs in the cases of bacteremia. This may have been due to the slower absorption of this drug. The sodium sulfapyridine cases comprise those in which tablets of this drug were administered orally. A few patients were given supplementary intravenous injections of sodium sulfapyridine but were not treated exclusively in this way.

## COMPLICATIONS OF PNEUMONIA

The complications are listed in table 6. All of the 10 patients with pneumococcal endocarditis diagnosed clinically died regardless of the type of therapy used, and none of the patients with pneumococcal meningitis following pneumonia recovered. There were 11 patients with empyema in the drug-alone group; of these 2 died (1 within twenty-four hours and 1 with pneumococcal endocarditis) and 4 came to thoracotomy. Of the 13 empyema patients in the drug-and-serum group 4 died (1 within twenty-four hours, 1 with meningitis and 1 with probable pneumococcal endocarditis), and 7 required thoracotomy. The remaining empyema patients in each group had thin fluid and recovered on repeated thoracenteses and continued oral administration of the drug. Fluid was demonstrated or suspected on admission in 7 of the 11 cases in the drug-alone group and in 5 of the 13 cases in the drug-and-serum group. There were 5 cases of sterile scrous effusion in the drug-alone group and 16 in the drug-and-serum group; of these cases, in 2 in the drug-alone group and in 7 in

1. Marshall, E. K., Jr.: Experimental Basis of Chemotherapy in the Treatment of Bacterial Infections, *Bull. New York Acad. Med.* 16: 723-731 (Dec.) 1940.

the drug-and-serum group there was demonstrable or suspected fluid on admission. There were 5 cases of non-putrid lung abscess, and it is our impression that perhaps more abscesses as sequelae of pneumonia will be

TABLE 5.—Distribution of Cases and Results According to the Drug Used

	Drug Only					Drug and Serum				
	Cases	Deaths	24 Hour Deaths	Bacteremia	Deaths	Cases	Deaths	24 Hour Deaths	Bacteremia	Deaths
Sulfapyridine.....	152	16	2	31	8	2	144	23	6	26
Sodium sulfapyridine...	33	4	0	8	3	0	45	5	3	12
Dextrose sulfapyridine..	68	8	2	12	6	1	52	7	3	10
Sulfathiazole.....	15	1	1	2	1	1	28	3	0	8
Sulfamethylthiazole.....	9	1	0	2	1	0	7	1	1	3
Sulfadiazine.....	29	4	1	6	1	0	22	5	3	5
Total.....	306	34	6	61	20	4	301	44	16	64

seen in the future than in the past, because some of the most acutely ill patients with heavy bacteremia, who in the past did not survive the acute stage of the disease, now live long enough to allow tissue breakdown to occur. This subject of pleural and parenchymal complications of pneumonia under modern therapy will be reported in detail in a subsequent communication.

Four of the women in this series were pregnant; 2 were in the drug-alone and 2 in the drug-and-serum group. All recovered. Two were bacteremic; 1 had 12 colonies per cubic centimeter of blood and recovered on drug and serum; the other had innumerable colonies in the blood and recovered on sulfadiazine alone. The latter patient went into labor after being in the hospital twenty-four hours and also had a thin empyema which was cured without surgery. All these patients were in the seventh or eighth month of pregnancy and only 1 did not deliver during the acute stage of the disease.

## DRUG AND SERUM REACTIONS

The toxic reactions ascribed to the sulfonamide drugs are listed in table 7. There were not enough cases in which treatment by every one of the individual drugs was given to make a comparative table of incidence which would be of statistical significance. However, it can be said that there was frequent and severe nausea and vomiting with sulfapyridine, dextrose sulfapyridine and sodium sulfapyridine, considerably less nausea and vomiting with sulfathiazole and sulfamethylthiazole, and practically none with sulfadiazine. The serious toxic reactions were infrequent with any of the drugs and were rather well distributed.

TABLE 6.—Complications (607 Cases)

	Drug Only	Drug and Serum	Total
Endocarditis.....	7	3	10*
Meningitis.....	4	3	7
Empyema.....	11	13	24
Serous effusion.....	5	16	21
	0	1	1
	3	2	5
	2	1	3

\* In three of these cases the diagnosis was confirmed at autopsy.

Only one fatality due to chemotherapy occurred, a case of toxic hepatitis and aplastic anemia due to sulfapyridine. In 1 of the sulfamethylthiazole cases already reported,<sup>2</sup> peripheral neuritis developed following the administration of 72 Gm. of the drug.

2. Solomon, Saul, and Kalkstein, Mennasch: Sulfamethylthiazole in Treatment of Severe Type II Bacteremic Pneumonia, New York State J. Med. 41: 270-272 (Feb. 1) 1941.

Serum reactions consisted in a small number of chill reactions and an occasional mild serum sickness. Once a questionable anaphylactic reaction possibly contributed to a patient's demise an hour after the serum had been administered.

## THE FATAL CASES

Of the 78 patients who failed to survive, 22 were admitted moribund or nearly so and died within twenty-four hours of admission. Of the remaining 56, 26 had some other serious systemic disease in addition to pneumonia. A list of the chief additional diseases occurring in the fatal cases is presented in table 8. The average age of the patients who died was 59.4 years for those receiving drug alone and 61.8 years in the drug-and-serum group. Although alcoholism occurs frequently in our Bellevue patients, for lack of reliable data we have not listed it as an associated systemic disease unless there was accompanying hepatomegaly and jaundice. It will be noted that many of the associated diseases were or of themselves would have become fatal, but because

TABLE 7.—Serious Toxic Reactions: Based on 607 Cases of Pneumonia Treated with Sulfonamide Drugs

Rash.....	5
Gross hematuria.....	6
Hemolytic anemia.....	2
Aplastic anemia and toxic hepatitis.....	1*
Granulocytopenia.....	6
Peripheral neuritis.....	1†

\* Fatal case. † Followed sulfamethylthiazole.

TABLE 8.—Associated Systemic Disease (Fatal Cases)\*

Disease	Total Cases		24 Hour Deaths	
	Drug Only	Drug and Serum	Drug Only	Drug and Serum
Heart disease				
Compensated heart disease.....	2	8†	0	4‡
Decompensated heart disease.....	1	4	0	1
C.F.	1	2	0	0
	2	0	0	0
Diabetes				
With ketosis.....	1	2	0	0
Without ketosis.....	2	1	0	1
Syphilis (latent).....	1	2	0	1
Leukemia				
	1	0	0	0
	0	1	0	1
	0	1	0	1
Jaundice.....	1	1	0	1
Chronic pulmonary tuberculosis.....	1	0	0	0
Total cases.....	13	22	0	10

\* When more than one associated disease was present only the more serious disease is listed.

† Includes two old hemiplegias and one recent myocardial infection.

‡ Includes one old hemiplegia.

pneumonia precipitated the patient's death the case was nevertheless included in the series.

## COMMENT

Fleming,<sup>3</sup> Bullowa, Osgood, Bukantz and Brownlee<sup>4</sup> and Finland, Lowell and Spring,<sup>5</sup> by in vitro experiments, have demonstrated that pneumococci are killed more easily by sulfapyridine plus antipneumococcus

3. Fleming, A.: The Antibacterial Action in Vitro of 2 (p-Aminobenzenesulfonamido) Pyridine on Pneumococci and Streptococci, Lancet 2: 74-78 (July 9) 1938; Serum and Vaccine Therapy in Combination with Sulfanilamide or M. & B. 693, Proc. Roy. Soc. Med. 32: 911-920 (June) 1939.

4. Bullowa, J. G. M.; Osgood, E. E.; Bukantz, S. C., and Brownlee, Incz E.: The Effect of Sulfapyridine Alone and with Serum on Pneumococci Pneumonia and on Pneumococcus-Infected Marrow Cultures; Results in Four Hundred and Thirty-Seven Pneumococcal Pneumonia Patients Rotated for Treatment, Am. J. M. Sc. 199: 364-380 (March) 1940.

5. Finland, Maxwell; Lowell, F. C., and Spring, W. C., Jr.: Clinical and Laboratory Studies on the Use of Serum and Sulfapyridine in the Treatment of the Pneumococcal Pneumonias, New England J. Med. 222: 739-747 (May 2) 1940.



serum than by either agent alone. MacLeod,<sup>6</sup> in experimental type III infections of mice, Kepl and Gunn,<sup>7</sup> in early type I infections in rats, and Powell and Jamieson,<sup>8</sup> using a variety of types in rats, have obtained better results with sulfapyridine and serum together than with either agent alone. However, Wright and Gunn<sup>9</sup> failed to get better results in type III infections in rats with combined therapy than with sulfapyridine alone, or in the longer established type I infections.<sup>7</sup>

Haviland,<sup>10</sup> in studying type I pneumonia in human beings, found that administration of serum as well as drug maintained antibodies in the blood during the whole course of the disease. He suggests that, instead of waiting for the appearance of antibodies (which with drug treatment alone may not occur for several days after the temperature has fallen to normal), 100,000 units of serum be given routinely four hours after the start of chemotherapy. This is a theoretical consideration which is yet to be shown to have practical application, particularly since it has been demonstrated<sup>11</sup> that some patients may recover without demonstrable antibodies in the blood and that others may die despite the presence of a high titer of antibodies.

Bullowa, Bukantz and de Gara<sup>12</sup> have presented suggestive evidence that the presence of free capsular polysaccharide in the blood stream implies a more serious prognosis than does bacteremia alone and that sulfapyridine, alone or even with specific serum, may not cure such patients. They state that "it remains for further observations to determine whether or not a greater reduction in mortality of pneumococcal pneumonias, or other pneumococcal infections, may be accomplished by the inclusion of this laboratory criterion as a guide to therapy."

With respect to the application of experimental results to the treatment of patients, the literature is replete with opinions as to the role that serum should play in the treatment of pneumonia, but, as Finland<sup>13</sup> points out, there is little basis for estimating the relative efficiency of combined therapy compared with chemotherapy alone, in spite of the large number of cases included in a host of clinical reports.

To the best of our knowledge, only two studies have appeared on the use of serum in other ways than merely in seriously ill patients, Bullowa and his associates<sup>4</sup> have reported a series of 324 cases treated in treatment three ways; the mortality rate in the group receiving serum alone was 17.3 per cent, in the group receiving sulfapyridine alone, 8.1 per cent, and in the group treated with both agents, 11.2 per cent. Dowling,

Abernethy and Hartman<sup>14</sup> have recently reported a series of 162 cases alternated between drug therapy and combined therapy; the mortality rate was 12.5 per cent in the drug alone group and 9.8 per cent in the drug plus serum group. The authors felt that the patients who received serum as well as sulfapyridine responded more promptly, and that serum seemed to be a valuable adjunct to sulfapyridine in patients over 40 years of age.

Our clinical results confirm the previously reported failures in smaller series to affect the mortality rate to any significant extent by using serum routinely in addition to chemotherapy, regardless of the stage of the disease in which treatment is started. We have not noted more prompt responses in the patients receiving combined therapy.

What, then, is the present role of serum in the treatment of pneumonia? There will probably be no disagreement with the statement that serum should be used for patients who cannot tolerate the sulfonamide drugs or for those who fail to respond satisfactorily within twenty-four to forty-eight hours to drug therapy. However, our study certainly provides no argument for the routine use of serum in the treatment of all cases of pneumonia. Whether the patient was treated early or late in the disease, whether bacteremia was present or not, whether the patient was young or old, and regardless of the presence or absence of systemic disease, our results were the same in the drug-alone as in the drug-plus-serum group. The group of patients who cannot tolerate sulfonamide therapy probably should include those who have had a previous serious reaction to such therapy, e. g. granulocytopenia, hepatitis or hemolytic anemia. When sulfonamide therapy has to be discontinued before its full benefit has been obtained, administration of serum may be helpful in furthering the response or in preventing relapse.

In our private practice we have used serum several times with gratifying results for patients who failed to respond to chemotherapy. Whether these patients would not eventually have recovered without the additional use of serum we cannot say. Our Bellevue study would lead us to believe that they would have done so. In the Bellevue group there were a number of delayed responses to chemotherapy. We were constantly on the lookout for patients in the drug-only group to whom we might feel that an injustice had been done in not giving serum, but when the completed data were analyzed we found no such cases.

#### SUMMARY AND CONCLUSIONS

1. A series of 607 cases of pneumococcal pneumonia was alternated in treatment, by type, between chemotherapy and combined chemotherapy and serum therapy.

2. The fatality rate in the drug-alone group was 9.3 per cent, in the drug-and-serum group 9.8 per cent. The fatality rates were 11.1 per cent and 14.6 per cent respectively if twenty-four hour deaths were included.

3. In the bacteremic cases the fatality rate was 28.1 per cent with drug alone and 30.0 per cent with drug and serum. If twenty-four hour deaths were included, the fatality rates became 32.8 per cent and 45.3 per cent respectively.

4. In contrasting the results of treatment in the cases treated early with those in cases treated late in the disease, the additional use of serum did not lower the fatality rate in either group.

6. MacLeod, C. M.: Chemotherapy of Pneumococcal Pneumonia, *J. A. M. A.* **113**: 1405-1410 (Oct. 7) 1939.

7. Kepl, M., and Gunn, F. D.: Sulfapyridine and Serum Therapy in Experimental Lobar Pneumonia of Rats, *Proc. Soc. Exper. Biol. & Med.* **40**: 529-532 (April) 1939.

8. Powell, H. M., and Jamieson, W. A.: Combined Therapy of Pneumococcal Rat Infections with Rabbit Antipneumococcal Serum and Sulfapyridine (2-Sulfanilyl Aminopyridine), *J. Immunol.* **36**: 459-465 (May) 1939.

9. Wright, J. L., and Gunn, F. D.: Sulfapyridine and Serum in Experimental Type III Lobar Pneumonia, *Proc. Soc. Exper. Biol. & Med.* **44**: 523-525 (June) 1940.

10. Haviland, J. W.: Type I Pneumococcal Pneumonia, *Bull. Johns Hopkins Hosp.* **68**: 32-49 (Jan.) 1940.

11. Finland, Maxwell, Spring, W. C., Jr., and Lowell, F. C.: Immunological Studies on Patients with Pneumococcal Pneumonia Treated with Sulfapyridine, *J. Clin. Investigation* **19**: 179-199 (Jan.) 1940.

12. Bullowa, J. G. M., Bukantz, S. C., and de Gara, P. F.: The Balance Between Capsular Polysaccharide and Antibody in Relation to the Prognosis and Therapy of Pneumococcal Pneumonia, *Ann. Int. Med.* **14**: 1348-1359 (Feb.) 1941.

13. Finland, Maxwell, Report on Medical Progress: Treatment of Pneumonia, *New England J. Med.* **223**: 499-506 (Sept. 26) 1940.

14. Dowling, H. F.; Abernethy, T. J., and Hartman, C. R.: Should Serum Be Used in Addition to Sulfapyridine in the Treatment of Pneumococcal Pneumonia? *J. A. M. A.* **115**: 2125-2128 (Dec. 21) 1940.

5. The average response as judged by rapidity of fall in temperature in type I and type II cases was not enhanced by the use of serum.

6. No essential differences were noted in the therapeutic response obtained with the various drugs used—sulfapyridine, sulfathiazole, dextrose sulfapyridine, sodium sulfapyridine, sulfamethylthiazole and sulfadiazine.

7. Of the 78 patients who died, 48 either entered the hospital in a near terminal condition and died within twenty-four hours or had some other severe systemic disease in addition to pneumonia.

8. The present role of serum in pneumonia appears to be its use in the treatment of patients who cannot tolerate the sulfonamide drugs or who do not respond satisfactorily within twenty-four to forty-eight hours to sulfonamide therapy.

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## BURNS OF THE HAND

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As most persons are dependent on the use of their hands for a living, a minor burn of the hands may be a distinct handicap and a major burn a catastrophe. Improperly treated minor burns may easily become major ones, and improperly treated major ones may result in the loss either of the hand or of the life of the patient himself.

The treatment of burns of the hand differs sufficiently from the treatment of burns elsewhere on the body to justify calling particular attention to the difference. In a previous paper<sup>1</sup> the early and late treatment of burns in general was discussed. Certain suggestions made in that paper for treatment of burns of the extremities need to be amplified.

Burns of the hand are caused primarily by explosion, by fire or by contact with hot liquids. The hands of the nonindustrial worker are usually exposed and therefore are more frequently burned than other parts of the body. In the agony of pain and fright the hands are often used to put out flames elsewhere on the patient's own body or on that of some one else. The ungloved hand is obviously more severely burned in instances in which sticky hot liquids or oils are spilled, in which there is a single flash of flame, as in some explosions, or in which momentary exposure to steam occurs. Burns are not often severe if the patient happens to be wearing gloves that can be removed quickly before too deep penetration of the causal agent. Grease-soaked gloves that fit tightly at the wrist and are hard to remove when ignited produce a much deeper burn than would occur if the gloves had not been worn. If hot liquids are spilled over woolen or cotton mittens with knit elastic wristlets, the heat of the liquid is often held in the fabric, resulting in injury to the deeper structures. Since the household mangle has become a popular addition to many home laundries frequent and extremely extensive burns of the hand have been seen. In the latter cases the trauma caused by the crushing

action of the roller complements the trauma from the heat of the ironer.

### EARLY TREATMENT OF FRESH BURNS OF THE HAND

The heavy skin on the palmar surface is a natural protective barrier to all injuries, including burns. The dorsum of the hand is likewise toughened to some degree as compared with unexposed portions of the body. However, it is also a corollary that the tougher the hands, the dirtier they are likely to be. Débridement and complete cleansing of burns in the latter group of patients are much more difficult and less certain of success.

Burns of the hands alone are generally less shocking than burns received elsewhere on the body. The patient is more or less accustomed to receiving injuries to his hands, so the element of fright is not as great. Because the hands are exposed, pain from friction of the coverings or clothes on the burned surface is thereby avoided. When the hands are toughened and calloused they are less likely to be as sensitive to pain as some normally unexposed area. If shock does exist, it is to be combated in the usual fashion, with heat to the body, intravenous administration of fluids or transfusion of serum, morphine and the body in the Trendelenburg position. In all cases, pain is enough of a factor to warrant the routine administration of some type of sedative or analgesic.

A good first aid measure is to place the injured hand immediately in a bowl of clean water so that all the burned surfaces are below the water level. The patient will experience pain when the hand is first immersed, but this will quickly be relieved as the air is excluded from it.

After the initial pain and shock have been treated, one proceeds with the treatment of the local area. This should take the form of a careful débridement. All children and hypersensitive adults should be given a general anesthetic for this procedure. In stoical adults with a high threshold for pain adequate analgesia is often obtained with a sufficiently large dose of morphine.

The débridement consists of a thorough cleansing with a solution of 50 per cent green soap and 50 per cent hydrogen peroxide. The finger nails are clipped if they are not to be used for traction (explained later in the paper). All blisters are opened and the raised dead skin is removed. The inside of a raised blister in the hair-bearing areas must be considered as having been contaminated by the dirty surface hairs which were drawn into it as the skin was raised by the fluid formed beneath it. Some surgeons prefer to leave the blisters unbroken in areas not bearing hair, such as the palmar surface. In my experience the ones left unbroken frequently break or go on to infection through small cracks in the macerated surrounding skin. On excessively hairy hands, if the hair has not been burned off it should be removed by extremely careful shaving—even over the burned surfaces. If this is not done the hairs are later enmeshed in either the eschar or the crust that is formed. When the burn heals, the removal of either the crust or the eschar is both hindered and painful if the hairs have been allowed to become caught in it. After being cleansed and debrided, the hand is flushed with physiologic solution of sodium chloride and then soaked in some mild antiseptic solution, such as hexylresorcinol solution or solution of merthiolate. Occasionally a 70 per cent solution of alcohol is used for a final wash, but there are two objections to its use: First, it is extremely painful if the patient is not

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1. MacCollum, D. W.: The Early and Late Treatment of Burns in Children, *Am. J. Surg.* 39: 275-311 (Feb.) 1938.

under a general anesthetic and, second, if there are islands of skin that are just barely viable the 70 per cent solution of alcohol may possibly destroy them and thus create a relatively deeper burn.

At this point the operator must decide which of the various medicaments are to be applied to the burned surface while it is healing. One or two generalities may help in such a decision:

1. An eschar of any type is never to be used if either the hand or the fingers are burned on all surfaces. Because the eschar forms a tight, rigid sheath, the subsequent edema beneath it may be big enough to shut off the circulation to the fingers, with resultant gangrene.

2. An eschar of any type is undesirable when movement of the fingers is not able to be controlled, as in young infants or in an epileptic adult. A thin, flexible eschar will stand some movement, but none will be able to withstand motion through 90 to 120 degrees, which may occur with complete flexion of the fingers.

3. An eschar of any type is not to be used if the operator is uncertain of the efficacy of his débridement. Unless he is convinced that he has made the area really clean it is perhaps better judgment to cover the burns

that the débridement need not necessarily be as thorough as when tannic acid is used. The obvious advantage of the gentian violet alone or in combination with the other dyes is this bactericidal action, but unfortunately many surgeons depend too much on this quality



Fig. 2 (case 2).—Burns of the fingers from boiling water treated with tannic acid jelly. Eschars were produced which tightened with the subsequent edema so as to result in gangrene of the ends of the index, middle and ring fingers. It was felt that the burns were of no more than second degree and that the loss of the fingers was preventable.

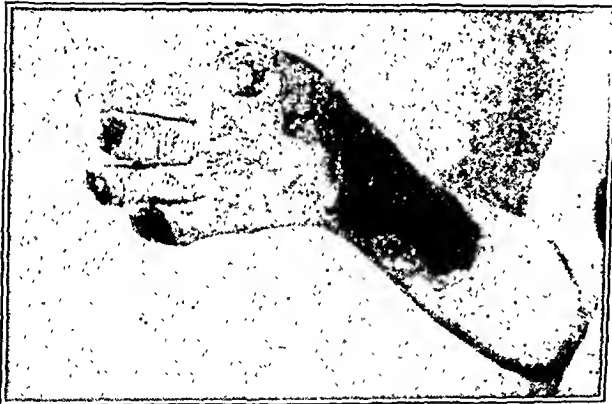


Fig. 1 (case 1).—Complete burn of the right hand (from contact with stove) treated with tannic acid eschars on all surfaces. Burns were not kept sterile, so the combination of infection and gangrene from constriction of the eschars at the finger tips resulted in loss of a part of the thumb and all fingers with the exception of the index finger.

with sheets of tulle gras<sup>2</sup> over which are placed gauze sponges soaked in a mild antiseptic.

If an eschar is to be used the operator has several varieties from which to choose. The most common ones are those formed by tannic acid alone or in combination with silver nitrate, by gentian violet alone or in combination with crystal violet and brilliant green or by wax, ferric chloride or iodine. When tannic acid alone is used a 2.5 per cent solution is sprayed on the burned surfaces at frequent intervals (every thirty to sixty minutes for about twenty-four hours). This may be varied by applying a 5 per cent solution of tannic acid followed in ten to fifteen minutes with a solution of 10 per cent silver nitrate, producing an immediate and permanent eschar. If the latter combination is used, it is to be emphasized that after the initial administration no further application of either tannic acid or silver nitrate is to be carried out or the eschar will become too thick. Gentian violet in a 2 per cent aqueous solution, either alone or in combination with brilliant green and crystal violet, has a definite bactericidal effect, so

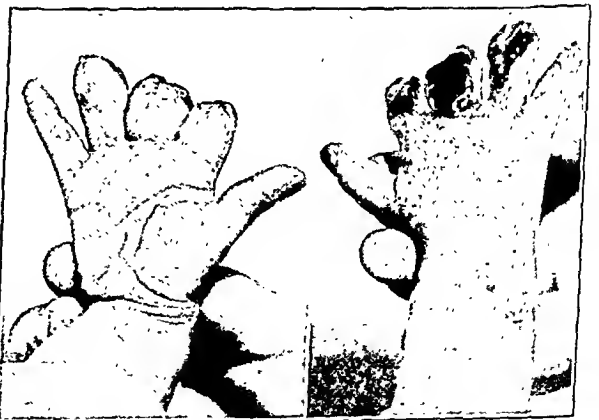


Fig. 3 (case 2).—Appearance after ends of the fingers dropped off, leaving raw surfaces on the dorsum still unhealed.

a raw surface still remains, for it denotes destruction by the burn of all the layers of the skin with or without involvement of deeper tissues. If the raw area is large it will be necessary for epithelization to proceed from the periphery, and the resultant scarification in a region as imobile as the hand will cause contractures and

2. A wide mesh gauze impregnated with petrolatum, compound tincture of benzoin and Peruvian balsam, sterilized in an autoclave for fifteen minutes under 20 pounds of pressure.

deformities. It naturally follows that further plastic procedures to restore this lost tissue will then be required.

It must be emphasized that to be effective an eschar must be kept as immobile, as dry and as sterile as possible. However, bandages and splints cannot be applied over the eschar or it will become moist and macerate. To keep the burn dry and sterile, the hand is placed in a heated cradle that is covered with sterile sheets. To keep down edema, the hand should be elevated well above body level. To keep the fingers immobilized, it is advisable to pass sterile rubber bands or fine steel wires through each finger nail and attach them to the ring of a banjo splint. Little force is able to be applied to these traction lines, for they soon tear or cut through the nail. They serve merely as check-reins to remind the patient to keep the fingers quiet and in extension. Consequently, a cooperative, intelligent patient is the first prerequisite when this method

below the age of 5 years and all patients above this age who are of below average intelligence, or if the burns completely encircle the fingers the use of an eschar is not advisable. In the uncooperative group, motion will destroy and crack the eschar, leaving portals of entry for possible infection of the burn beneath. In the group with total burns the eschars, if tight, may act as tourniquets. Consequently, some type of ointment should be employed as a dressing if either of these situations exists. This is to be followed by careful bandaging of each finger (no matter how small) as a separate unit and firm attachment of all fingers, hand, wrist and arm to a splint for immobilization. This method presupposes that the operator realizes (1) that fluid is going to be lost from the burn in large quantities, (2) that he must be equipped to recognize the rate of loss of serum by studies of the blood and serum protein, (3) that he will be able to carry out the replacement of this serum by transfusions of blood or of blood plasma

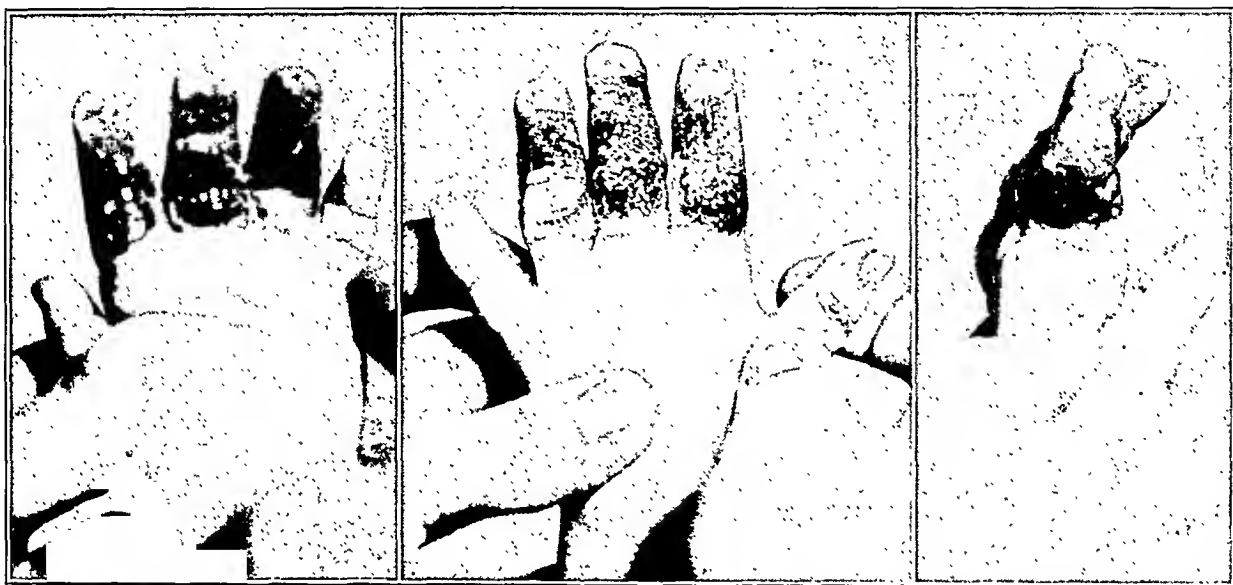


Fig. 4 (case 3).—Third degree burns of the fingers from boiling water. Burns were debrided and treated with sterile ointments. Burn completely encircles each finger.

of treatment is employed. Some surgeons advise the insertion of straight needles through the distal phalanges similar to small Kirschner wires, for traction. These are to be recommended only if one can be absolutely certain of initial and continued sterility in the region of the insertions of the needles during the time of healing.

Healing of areas of first and second degree burns will be indicated when the eschar becomes dry and separates from its base. The separated portions should be removed with sterile forceps and scissors, with care not to expose any raw surfaces by being too rough or by being overenthusiastic about the eschar's early removal. Small areas of third degree burn will continue to heal from their peripheries under the eschar, which will finally loosen and drop off. Over large areas of third degree burn the eschar will remain tightly adherent for a longer period, during which time healing still goes on. Finally it will become softened and should then be removed, exposing the granulations beneath it.

Again it must be pointed out that if the patient is not of the cooperative type, and this includes all children

as the situation indicates, (4) that he must carry out the most rigid aseptic technic in dressing and nursing care to prevent contamination and (5) that he must do all this with the utmost gentleness, both to avoid pain to the patient during the changes of dressings and to avoid injury to the burn itself.

It has been found that if an ointment is to be applied to the hand it must first of all be sterile. It is preferable to have this ointment impregnated in strips of gauze so that it can be bound about each finger rather than to attempt to spread grease over a slippery, raw surface to which it does not readily stick. In addition, if the gauze has a wide, open mesh, it allows both serum to escape and antiseptics to reach the burn. Strips of tulle gras meet these two requirements. Over the tulle gras may be placed strips of regulation type surgical gauze which are either dry or soaked in a mild antiseptic. My choice of antiseptic is usually one of three: hexylresorcinol solution, solution of merthiolate or a mixture of alkyl-dimethylbenzyl ammonium chlorides.

To do an adequate dressing to a hand, it is necessary for the operator to scrub his hands and put on sterile

rubber gloves rather than attempt accurate placement of the dressing with sterile instruments. In this way he is also able to control the movements of the fingers and hold parts of the dressing in place while the rest of it is being applied. No two raw surfaces are to be allowed to come in apposition. Therefore, each finger requires a separate dressing. A padded basswood board cut to fit the hand and each finger is usually used for immobilization, the hand being fixed to it with narrow elastic adhesive (elastoplast) and covered with elastic bandage and stockinet to keep the elastic bandage from becoming displaced. The hand, wrist and arm are included in this splinting. If it is possible, the tip of one unburned finger should be left exposed so that the circulation may be checked. When a finger is left exposed and is to be tested for blanching, it is to be remembered that the tip should be touched with a sterile instrument rather than with the nurse's or physician's unsterile hands. If all fingers have been burned and it is impossible to leave any exposed, great care and constant attention must be paid to the application of the

First and second degree burns should heal within ten to fourteen days. Areas of third degree burn, if small, will continue to heal from the periphery of each raw island, provided the dressings are applied tightly enough to keep the granulations flattened. Large areas of third degree burn will require replacement of tissue from some other site to prevent contractures.

#### LATE TREATMENT OF BURNS OF THE HAND

If the patient fails to come under medical supervision until several days or weeks after the injury, the primary efforts should be directed toward getting the burn as clean as possible. This should not be done by an operative débridement because of the danger of breaking down local resistance in what is certain to be an infected field. Soaks daily or twice daily in a mild, warm antiseptic solution followed again by dressings of tulle gras are my regimen of choice. Over the tulle gras are placed sponges wet in diluted solution of sodium hypochlorite, chloramine-T or eusol, and over this a dressing identical to that previously described. After a week to ten days of this regimen the raw areas will usually be in condition for grafting.

#### GRAFTS

Whether the burns have healed with obvious contractures or whether raw areas still remain to be healed, a fundamental evaluation now must be made of exactly how deep the scarification has been or will be. Dependent on this decision is the type of graft that will be employed for the best functional and cosmetic result. In all other areas of the body if healing is allowed to continue without grafting, contracting bands of heavy scar tissue may develop, may tighten and with exercise and massage may loosen sufficiently so that replacement of skin or subcutaneous tissue is not found to be necessary. In either the hand or the

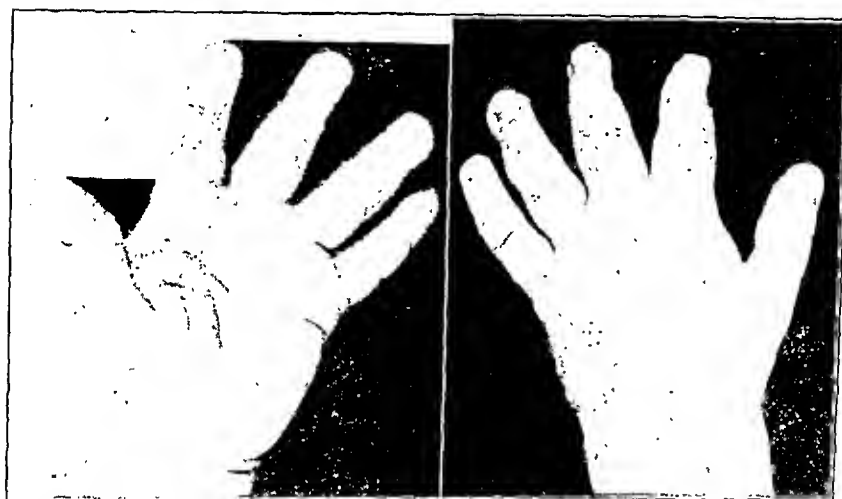


Fig. 5 (case 3).—Result after cleansing over a period of fourteen days and covering the defects with thick razor grafts.

bandage. This is of particular importance to the surgeon who usually treats adults and who finds himself bandaging the fingers of a 6 month old baby. The hand is elevated above the level of the rest of the body by placing the splint on a heavy block pillow and protecting the area from the weight of the bedclothes.

The dressings are to be changed once every forty-eight hours, or oftener if the exudation of serum is sufficient to soak through to the outside. Once the outer dressing is discovered to be wet, the burn has been theoretically contaminated by retrograde bacterial action in a moist field. Too frequent dressings may be injurious to the burn and may slow up healing. The frequency of change, therefore, becomes a matter of nice judgment and is able to be regulated only by the patient's progress.

Removal of the bandages and outer sponges can always be accomplished without pain to the patient. The removal of the layers next to the burn is best effected after the hand has been soaked in a sterile saline solution for five to ten minutes. After this length of time the creation of a current in the basin by means of a sterile paddle frequently removes the remainder. In this way the burn is washed thoroughly and there has been the minimum of disturbance to the healing edges.

foot the same sequence is more likely to result in a permanent contracture without the subsequent relaxation, due primarily to a persistent shortening of muscles, tendons and tendon sheaths, even though they may not have been involved in the burn. It is therefore necessary to prevent the formation of these contractures by early grafting or, if they have occurred, to correct the deformity as soon after healing has taken place as it is possible.

Every effort should be employed to cleanse the hand thoroughly before operation. If one is dealing with a completely healed but scarred, contracted hand several scrubbings with soap and water reaching all the folds and crevices should be carried out during the forty-eight hours preceding repair. The common procedure of wrapping or bandaging the hand after these preoperative scrubbings is to be avoided, because usually this causes the hand to perspire, thereby actually raising the bacterial count. Obviously, prevention of gross contamination such as would occur with normal work is to be avoided.

At the time of operation the hand is again prepared with soap and water, ether and alcohol. Antiseptics that stain the skin are to be avoided, for it may be impos-



sible to make a decision of questionable viability of a flap if it has previously been discolored with a dye. A blood pressure cuff may be placed on the arm, loosely enough so that it will not hinder venous return. The cuff may be inflated then as an emergency tourniquet at any time during the operation. The use of a tourniquet throughout the operation is not advised, because in the bloodless hand it is sometimes difficult to distinguish scar tissue from normal fascial layers. The ischemia of small blood vessels and subsequent edema which follows removal of the tourniquet will also jeopardize the take of any graft. It is essential that all bleeding be controlled either by hot-pressure packs or by crushing the ends of the vessels and that ligatures be conserved for as few of the larger vessels as possible.

It is vital that not "just enough" scar tissue be removed to relax the contractures but that all of it be removed. If a deep scar is left the graft over it will become wrinkled and the function of the hand or digits will be impaired. If the tendon sheaths or tendons are

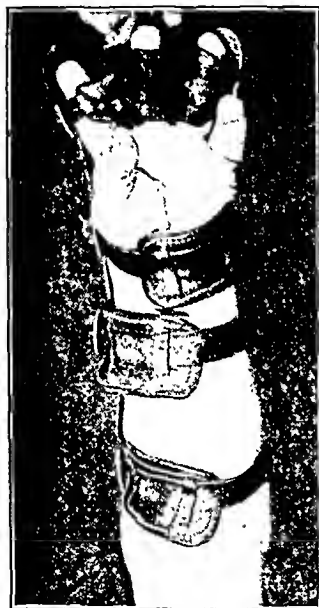


Fig. 6 (case 3).—Splint that was worn by patient for a period of six months after grafting.

involved in the scar they should be carefully dissected out and freed from the surrounding tissue. If adhesions exist between tendon and tendon sheath curtailing the movement of the fingers it is wise to remove the entire sheath and leave the tendon exposed to the new layer of fat that will be brought in by means of a pedicle graft. If the tendon has been destroyed completely the contracture must be relieved by excision of the scar which has replaced it, and at a second operation an attempt must be made to restore motion by transplants of tendons or by uniting the ends of the divided tendons by inserts of

fascia lata. If only a short segment of the tendon is destroyed it is possible to lengthen the tendon at this time by any of the usual operations for lengthening tendons anywhere. It is a wise precaution to leave a window in the sheath over the point of suture of the tendon because motion of the finger cannot be carried out until several days after operation, if the graft over it is to be saved. Adhesions between the operative site in the tendon and the fat of the graft are easier to break than those which would form between tendon and tendon sheath if no window had been left.

Now that all scar tissue has been removed, bleeding controlled and as much motion as possible restored to the hand and fingers it is necessary to employ some type of graft to cover the defect.

In all grafts to the hand, skin with or without subcutaneous tissue must be brought from some other site and placed where it must withstand a good deal of wear, and it must be as inconspicuous as possible. It is to be remembered that skin taken from the abdomen or leg or any other site and placed on the hand will

never take on the characteristics of the true skin of the hand. The skin itself, whether it is on a free graft without fat or on a pedicle containing a subcuticular panniculus, has, and always will have, essentially the same characteristics as that on the site from which it

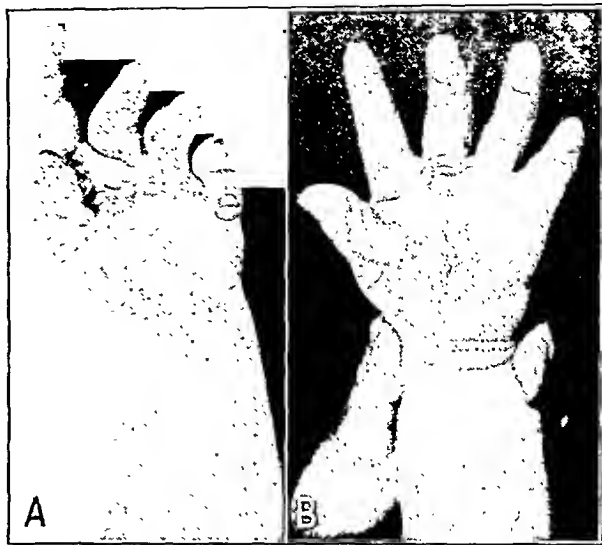


Fig. 7. (case 4).—A, scar contracture of the hand in a girl aged 2 years, the result of a third degree burn of the palmar aspect of the hand and all fingers but the index finger. Note the lack of extension of the fingers and extreme adduction of the thumb from the scarred hands. B, result eighteen months after the scar had been dissected out and one large unperforated thick razor graft had been applied. All fingers and the thumb have an absolutely normal range of mobility, and the graft matches the surrounding tissue very well.

came. It has been frequently stated that skin grafted to the hand or the foot should always be accompanied by a layer of fat and subcutaneous tissue so that a pad will be formed to withstand trauma and prevent the new skin from breaking down. This is not always correct. If only the skin of the hand, either the back or the palm, has been destroyed and there remains after dissection of either the scar or the raw, unhealed area

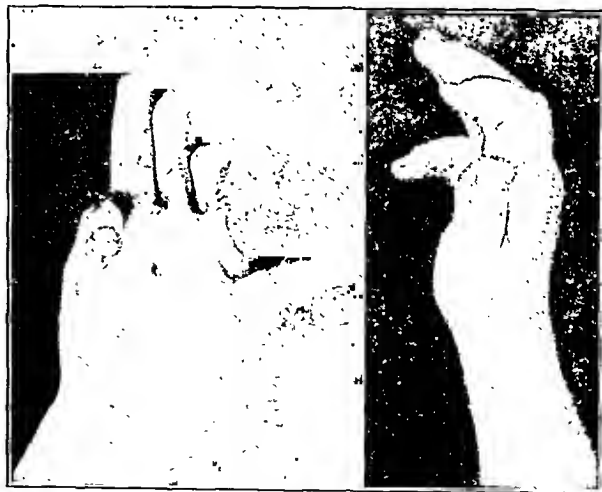


Fig. 8 (case 8).—Heavy scarring from a fourth degree burn received three years before these pictures were taken.

the normal fatty pad of the hand, it is necessary to replace the destroyed skin only by a free graft without fat. If, however, the fatty pad has been destroyed or the scar extends deeply enough to involve the fascia, tendon sheaths or tendons, then without question the

graft of choice is some type of pedicle containing the required amount of subcutaneous tissue.

If a free graft is to be used the recipient site must be even and firm, without foreign bodies such as sloughing tissue, bits of suture material and hematomas.

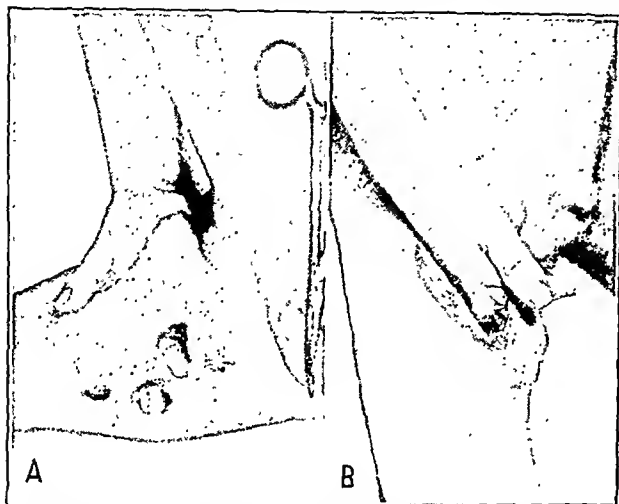


Fig. 9 (case 8).—After dissection of all scar tissue including tendon sheaths, the hand was placed in a pocket on the inner side of the thigh. The donor area was covered at the same time by cutting thick razor grafts and gluing them to the back of the hand so that they would be in apposition with the raw surface as the pedicle was attaching itself to the palmar side.

Either a thick razor graft or a full thickness graft more nearly imitates the thickness of the normal skin of the hand. Whichever one is used, there is little difference in the end result, provided it is done properly. The choice usually is dependent on which one the surgeon

uses varying greatly with each surgeon. I have found an effective dressing to be strips of tulle gras applied over all grafted surfaces, over which are placed narrow sponges soaked in a 1:5,000 solution of acriflavine hydrochloride. These sponges help to prevent moisture, maceration and subsequent infection in an area which perspires easily. They are covered by dry gauze, narrow strips of elastic adhesive (elastoplast), Ace bandage and stockinet. The hand, wrist and arm are then fixed to a light wooden splint by adhesive tape and bandages.

The dressing is usually left undisturbed until the seventh or eighth postoperative day. It is then carefully removed and a dressing identical to the first one reapplied except for the omission of the sponges soaked in acriflavine hydrochloride. In two to three weeks after operation the graft will be ready for exposure to the air, gentle massage and both active and passive motion. By far the most important element in the proper postoperative care of free grafts to the hand is the realization that unless the fingers are adequately splinted for at least six months distressing contractures of the graft will inevitably take place. The resultant deformity of the fingers is hard to overcome once the contractures have been allowed to occur. To avoid this, patients with such grafts are put on a regimen of stretching, exercise and massage for two to three periods a day, none of which last any longer than thirty to forty-five minutes. For the remainder of the time the hand is splinted as shown in figures 6 and 11. At the end of six months the hand is allowed out of the splint during the day but at night is confined again in the splint over a period of an additional six months or more. Numerous examples of failure of adequate post-

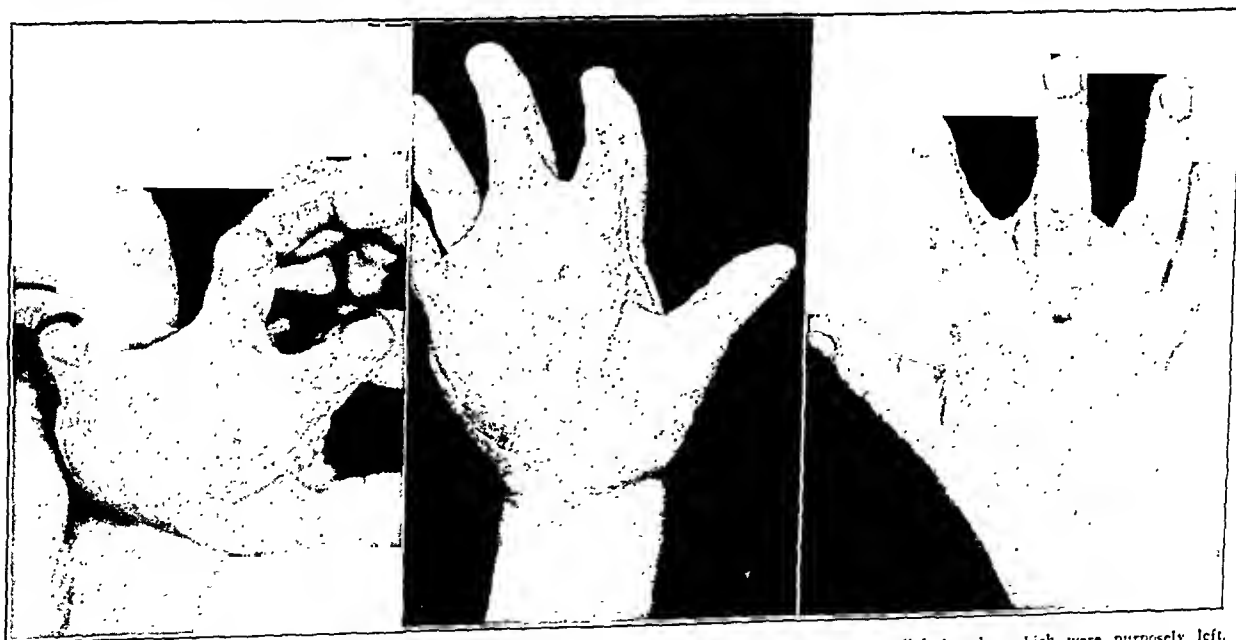


Fig. 10 (case 8).—Result one year after the pedicle had been placed on the hand. Note the interdigital webs, which were purposely left. Note also the thickness of the pedicle flap.

can handle with the best result. In order to prevent maceration and slow healing at the periphery, it is essential that the graft match the defect absolutely without overlapping on the normal skin. To prevent displacement of the new skin when the dressing is applied, it is advisable to suture it evenly to the edges of the raw surface. A dressing is then applied, the type of mate-

rials used have been seen. Once secondary contractures have occurred an attempt can be made to straighten the fingers by a vigorous regimen of physical therapy, but frequently a second operative procedure will be necessary. The second procedure can seldom take the form of a free graft because too much of the subcutaneous fat will need to be removed in order to

relieve the contractures again. Necessarily, a thin pedicle graft is usually employed with good result.

Whenever a pedicle graft is to be used, whether it is one with a single or a double hinge, open or tubed, the donor site must be chosen with care. Although the usual donor sites are the abdomen, buttocks or thighs, it is important that the operator plan to attach the hand to the site in such a fashion that the hand, wrist, elbow and shoulder are in neutral positions during the period of healing, which lasts two to three weeks. If distortion of any part is allowed the patient will be violently uncomfortable, squirm about in the dressing to ease muscular cramps, pull on the pedicle and destroy the graft.

After complete dissection and preparation of the base similar to that described previously, a pattern of the defect is first marked and cut out of muslin with an extension on one side to represent the pedicle or hinge. It is important for this hinge to be as wide as any portion of the flap to be raised. With the pattern held tightly to the recipient site the hand is moved to the position over the donor site that it will occupy during the period of healing. The edge of the hinge of the pattern is next transferred and held tightly to the donor site. The hand is then drawn away, allowing the pattern to fall flatly into position on the donor site. The design of the cloth pattern is next transferred to skin by marking around it with sterile ink. In choosing the site for the hinge it must also be remembered that the main blood vessels and lymphatics should preferably run parallel with the long axis of the flap. It is occasionally necessary to disregard this last precaution, but whenever it is disregarded the safety of the procedure is less insured.

The flap is then raised carefully and gently, so that no portions will be destroyed by unnecessary trauma in a site at which the blood supply, by the very nature of the operation, will be impaired. The flap is sewn to the hand with interrupted sutures both to the subcutaneous layers and to the skin. The site left raw by raising the flap and pedicle then may be closed by undercutting or by razor grafts from some other site (fig. 9). At the end of an interval varying from two to three weeks and dependent on how well the flap has become attached to its new site, the hinge is cut. If the hinge is wide and it is felt that the new circulation is not

yet adequate, the detachment may be carried out in two or more stages. If there has been an error in measurement of the flap the pedicle can be utilized to fill the defect. If the pedicle is not needed it may be returned to its original site and sutured there.



Fig. 12 (case 8).—Result eighteen months after the pedicle had been placed on the hand. The thickness has decreased considerably and matching of color is nearly normal.

When the hinge to a flap that is to cover the palmar surfaces of both fingers and the hand lies along the side of the hand (fig. 9A), it will be impossible to produce, at this first step, normal interdigital webs without interrupting the supply of blood to the distal portions of the flap. Therefore webs are purposely formed (fig. 10) and are released as a secondary procedure (fig. 12).

The postoperative care of the pedicle flap is of less concern than that of the free graft to the hand. The new flap is usually much too thick, rather soft and covered with hair or down. In fact, to shake hands with a person who has had a pedicle flap grafted to the palm has been imaginatively likened to shaking hands with a mouse! It is wise to splint the hand for a period of at least three to four months so that contractures will not develop along the lines where the flap joins the normal skin. If these lines of junction are along flexor surfaces of the finger it is wise to extend this period of splinting to six months and carry out the same routine as that advocated for free grafts. If the lines of junction are on extensor surfaces the normal movement of the hands will keep them well stretched and splinting will not need to be as protracted. As time goes on and the hand is used, the thickness of the flap diminishes considerably and the soft spongy feeling of the pedicle decreases but never completely disappears. With proper planning the functional and cosmetic result can be excellent.

#### CONCLUSIONS

The treatment of burns of the hand differs from the treatment of burns elsewhere on the body. An eschar can be used but only on hands that have not been burned completely. In complete burns an ointment should be used, accompanied by a rigid program of cleanliness and the systemic replacement of the fluid lost from the injured area. When the burns have not healed or there have been contractures from scarring, it is necessary first to diagnose exactly what tissue has been lost and to replace this loss with a similar type of tissue. Specific details outlined for the application of grafts to the hand have proved satisfactory both from a functional and from a cosmetic standpoint.



Fig. 11 (case 5).—The webs were released and the hand splinted again for six months except for physical therapy and intervals of active and passive motion.



FROZEN AND DRIED PLASMA FOR  
CIVIL AND MILITARY USE

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AND

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Recent experimental and clinical observations have definitely established the value of plasma as a substitute for whole blood in many clinical conditions.<sup>1</sup> The use of plasma in place of whole blood is suggested by two independent lines of thought. The first is a critical appraisal of the clinical indications for blood transfusion based on the physiologic action of each one of its components; the second is a matter of technical convenience concerned mostly with the problems of preservation and administration.

We will consider these two elements separately and briefly.

## CLINICAL CONSIDERATIONS

The accompanying table lists what we consider at present the indications for the use of plasma in place of whole blood as well as the conditions in which the use of whole blood is recommended.

From the clinical standpoint it is also most essential to bear in mind that plasma properly prepared offers the following advantages:

1. There is freedom from reactions, with the exception of relatively rare instances of mild urticaria, while whole blood transfusion carries with it a small but constant risk of severe and even fatal complications.<sup>2</sup>

2. Plasma may be given in much larger quantities and in repeated doses.

From the Clinical Laboratory, Bryn Mawr Hospital.  
This work was aided by a fund created by Mrs. John S. Sharpe, Mrs. Edward Law, the Women's Board and the Social Service Department of the Bryn Mawr Hospital.

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3. Plasma lends itself to concentration, if this is considered desirable.

4. Plasma does not add to hemoconcentration.

As the advantages of plasma over whole blood have become recognized, it is interesting to note the decrease in the number of whole blood transfusions as a result of the increased use of plasma. The chart indicates this tendency at the Bryn Mawr Hospital in the past three years. The number of patients annually admitted to the hospital during this time has increased from 5,214 to 5,487 and, while the number of blood donors has practically doubled, the number of whole blood transfusions has actually decreased.

The discrepancy between the total number of donors and the sum of whole blood and plasma transfusions as appears in the chart is due to the fact that the major-

## Indications for Plasma and/or Whole Blood Transfusions

1. Shock.....	{ With little or no hemorrhage With severe hemorrhage	Plasma  Plasma for immediate relief, followed by whole blood if warranted
2. Burns.....	.....	Plasma; whole blood contraindicated because of hemoconcentration
3. Infections.....	As a means to supply specific and nonspecific immune bodies	Plasma, supplemented by whole blood when severe anemia is present
4. Hypoproteinemias	Nutritional, hepatic, nephrotic and from various other causes	Plasma
5. Cerebral edema..	Such as accompanies injuries, toxemias, and so on	Plasma in concentrated form
6. Blood dyscrasias	{ Such as those with hemolytic tendencies, those with low prothrombin content, hemophilia, and so on Particularly those with hemorrhagic tendencies, such as certain forms of purpura	Plasma  Whole blood
7. Anemias.....	As palliative in various hypoplastic forms	Whole blood; plasma indicated in the chronic forms of hypoproteinemic anemias
8. Acute poisonings	Affecting the oxygen carrying capacity of hemoglobin, such as carbon monoxide	Whole blood

ity of the plasma transfusions in the past two years have totaled 500 cc. This amount requires, on the average, the blood of two donors.

## TECHNICAL CONSIDERATIONS

For a more complete understanding of the advantages offered by plasma, it is necessary to have a knowledge of the possibilities and limitations concerning preparation, preservation and administration of both whole blood and plasma. These may be summarized briefly as follows:

1. Whole blood has a limited and relatively short period of preservation.

2. Transportation of whole blood beyond short distances involves considerable difficulty because of the need of relatively constant refrigeration temperature, which can be obtained only with the use of heavy and bulky apparatus.

3. Whole blood needs to be typed and cross matched before administration.

4. Whole blood, if preserved more than a few hours after collection, requires filtration before administration.

On the other hand,

1. Plasma may be preserved for an indefinite period of time.
2. It is easily transported under adverse conditions when suitably prepared.
3. It does not need to be typed prior to administration if properly pooled or diluted, thus being immediately available for use in emergencies. Errors in blood matching due to hurried procedures are thus also eliminated.
4. Proper preservation (frozen or dried) prevents fibrin precipitation and renders filtration unnecessary.

The question of the use of plasma versus serum has been unduly magnified and often misunderstood. While we agree on the similarity of certain therapeutic actions of plasma and serum,<sup>3</sup> we continue to give preference to plasma for the following reasons:

1. A greater yield of the fluid phase may be obtained by separation of plasma if centrifugation is employed.
2. Production of plasma may be coordinated with the functioning of a blood bank.
3. Reactions to administration of properly preserved plasma are unknown, save for the rare mild urticaria mentioned before.

A disadvantage of citrated plasma that has been often pointed out is that it cannot be conveniently filtered through a Seitz or similar filter for purpose of sterilization because of clotting. Such filtration, however, is made entirely unnecessary by the adoption of a closed system for the collection, separation, pooling and distribution of plasma, by reducing to a minimum the time required by these operations, and by adequate checks on the sterility and toxic properties of plasma by means of cultural studies and inoculation of material into mice.<sup>4b</sup> The addition of merthiolate 1:10,000 may or may not be used as a further precaution against contamination. There remains another and more valid objection to plasma, namely that on standing fibrinogen and possibly also a globulin fraction precipitate out, forming a flocculent or granular material which must be filtered out before administration. The elimination of this difficulty is to be found in the rapid fixation of fibrinogen as well as of other labile elements by freezing immediately after separation and pooling, followed or not by drying from the frozen state. Obviously the plasma must be free of precipitate before fixation. This is always the case when plasma is drawn off immediately after centrifugation.

#### PRESERVATION AND STORAGE OF PLASMA IN THE LIQUID STATE

Keeping of plasma in the liquid state at 4 C. had been employed at the Bryn Mawr Hospital since 1931 as the principal means of preservation. More recently five severe pyrogenic reactions, following the adminis-

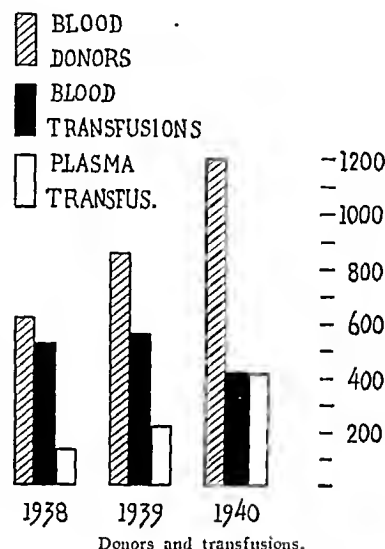
tration of plasma from a lot later proved to be contaminated, emphasized the dangers of this means of preservation:

CASE 1.—M. J., a woman aged 81, was operated on for removal of a carcinoma of the colon and cecostomy. On Sept. 26, 1940 intravenous administration of plasma was resorted to for correction of hypoproteinemia. After 200 cc. of pooled citrated plasma diluted with equal parts of saline solution had been administered, the patient had a severe chill followed by a temperature rise to 103 F. The plasma transfusion was immediately discontinued and the temperature returned to normal in two hours.

CASE 2.—H. C., a man aged 74, was operated on for relief of obstruction from peptic ulcer by gastrojejunostomy. On Oct. 4, 1940 transfusion of pooled plasma for correction of hypoproteinemia was resorted to. After receiving 200 cc. of a scheduled 500 cc. transfusion, the patient had a chill followed by temperature rise to 103 F. The temperature returned to normal in two hours.

CASE 3.—C. W., a man aged 65 suffering from anasarca associated with hypoproteinemia in the course of hypertensive heart disease, received on Oct. 3, 1940 80 cc. of pooled plasma regenerated from the dried state and concentrated four times. This material had been prepared from the same lot of citrated plasma used in the previous cases. The administration was followed by a chill and temperature rise to 101 F. The temperature returned to normal in four hours.

CASE 4.—C. S., a woman aged 35, was operated on for relief of intestinal obstruction caused by adhesions. A transfusion of pooled citrated plasma was resorted to on Oct. 4, 1940, immediately after the operation, for prophylactic



treatment of impending shock. Within fifteen minutes from the beginning of the transfusion, when less than 100 cc. had been administered, the patient had a severe chill, with a temperature rise to 105 F. The fever persisted for four hours. Two days later the patient was given 200 cc. of citrated pooled plasma from the same lot. This administration was followed in thirty minutes by a chill and temperature rise to 103 F. The temperature returned to normal in four hours.

The plasma used in the cases reported had been pooled from several lots of citrated blood, which had been preserved at 4 C. for a period of about five days. Merthiolate 1:10,000 had been added immediately after pooling, but no bacteriologic studies were made at that time.

Because of the long favorable previous experience with liquid plasma, it was at first thought possible that the reactions observed were due to a break in the proper technic in the preparation of glassware and rubber tubing. Consequently, as noted, a second dose of the same material was given to patient 4 after a rigorous check in the technic of administration and after cultures of the material had shown no growth. The possibility of an abnormally high isoagglutinin titer had also been ruled out. At this time centrifugation at high speed of 10 cc. of the plasma in question showed large num-

3. Best, C. H., and Solandt, D. Y.: Concentrated Serum in Treatment of Traumatic and Histamine Shock in Experimental Animals; *Brit. M. J.* 1: 799 (May 18) 1940; Use of Plasma or Serum as Substitute for Whole Blood, *ibid.* 2: 116 (July 27) 1940. Bond, D. D., and Wright, D. G.: The Treatment of Hemorrhage and Traumatic Shock by the Intravenous Use of Lyophilic Serum. *Ann. Surg.* 107: 500 (April) 1938. Levinson, S. O.; Neuwelt, Frank, and Neeches, Heinrich: Human Serum as a Blood Substitute in the Treatment of Hemorrhage and Shock, *J. A. M. A.* 114: 45 (Feb. 10) 1940. Levinson, S. O.; Rubovits, F. E., Jr., and Neeches, Heinrich: Human Serum Transfusion, *ibid.* 115: 1163 (Oct. 6) 1940. Ravdin, I. S.; Stengel, Alfred, Jr., and Prushankin, Mitchell: The Control of Hypoproteinemia in Surgical Patients, *ibid.* 114: 107 (Jan. 13) 1940. Thompson, W. D.; Ravdin, I. S.; Rhoads, J. E., and Frank, I. L.: Use of Lyophilic Plasma in Correction of Hypoproteinemia and Prevention of Wound Disruption, *Arch. Surg.* 36: 509 (March) 1938. Clegg and Dible.

4. Strumia, Max M.; McGraw, John J., and Reichel, J.: Preparation and Preservation of Human Plasma, *Am. Jour. Clin. Path.*

(a) Collection of Blood and Separation of Plasma, March 1941.

(b) Drawing Off, Pooling and Distribution of Plasma, April 1941.

(c) Freezing of Plasma and Preservation in the Frozen State, May 1941.

(d) Drying of Plasma by Low Temperature Condensation in Vacuo, June 1941.

bers of gram-positive bacilli, approximately 1 by 3 microns without spores, and square ended. Sediment containing large numbers of these organisms was cultured aerobically and anaerobically repeatedly, but no growth could be obtained.

Similar reactions have been observed by others<sup>5</sup> and suggested further studies on more adequate means of preservation.

The addition of merthiolate in proportion of 1:10,000 does not completely eliminate the danger of reaction from contamination, particularly when the plasma is separated from citrated blood which has been stored for a number of days in a blood bank. In addition to the danger of bacterial growth, it has been definitely demonstrated that prothrombin, complement and fibrinogen deteriorate considerably in liquid plasma stored at 4 C. It is possible to obtain plasma which is low in fibrinogen by permitting precipitation and settling in citrated blood allowed to stand many days before separation. This is a method widely used when blood plasma is prepared solely as a by-product of blood banks.<sup>6</sup> The disadvantages are similar to those associated with the storage of liquid plasma at 4 C.

The addition of calcium chloride to plasma to eliminate fibrinogen has been proposed.<sup>7</sup> This additional procedure is unnecessary if immediate fixation of fibrinogen by freezing is resorted to.

Summarizing, the storage of citrated plasma in the liquid state has been found to be undesirable because:

1. It is dangerous from the standpoint of ease of bacterial contamination, with development of pyrogenic substances.
2. It allows deterioration with loss of prothrombin, complement and fibrinogen, the latter forming a precipitate which must be removed before use.

#### PRESERVATION AND STORAGE OF PLASMA IN THE FROZEN STATE

As far back as 1932 it was noted that some of the more labile properties of plasma could be effectively preserved by keeping it in the frozen state, and that with certain precautions frozen plasma could be thawed out and used intravenously in human beings without adverse reactions.<sup>8</sup> More recently, additional studies have definitely proved that it is practical to keep plasma in the frozen state for several months and probably much longer without significant deterioration of prothrombin, fibrinogen, complement or the specific antibodies.

Freezing of plasma and keeping it in the frozen state as a means of preservation is offered as the method of choice, meeting the essential requirements in the great-est number of instances.<sup>10</sup>

The advantages of frozen plasma are that:

1. It is easily prepared.
2. It is economical.
3. It is easily stored and transported because of the wide range of the temperature of preservation as long as it remains frozen.
4. It retains its content of the most labile elements, such as prothrombin, without significant losses and remains sterile.

5. It does not require addition of water for restoration, as opposed to dried plasma.

6. It is clear and ready for administration without filtration when properly thawed.

Briefly the essential technical points are:

1. Fairly rapid freezing, requiring not more than three to six hours.
2. Maintenance in storage at a safe level below freezing.
3. Rapid thawing and warming to room temperature in the water bath at +37 C. with occasional gentle agitation. This operation should not require more than twenty-five minutes.

Plasma preserved by freezing, maintained in the frozen state and properly thawed results in a clear product indistinguishable in appearance from the original fluid. At present, all the plasma at the Bryn Mawr Hospital is preserved by freezing with the exception of a small amount which is dried from the frozen state. The adoption of routine preservation of plasma by maintenance in the frozen state has been justified by its safety and efficacy proved on numerous administrations over a period of six months. Serum may be properly stored by the same procedure.

#### DRIED PLASMA

Plasma dried from the frozen state has definitely been shown to be a dependable material, free of reactions and convenient for rapid restoration and administration. The advantages of dried plasma over frozen plasma are that:

1. It can be preserved and transported under all conditions of temperature without refrigeration.
2. It can be regenerated for administration in a short period of time under adverse conditions.
3. If indicated, it lends itself to administration in a concentrated form.

Dried plasma has been lately featured in many reports. Many new methods have been proposed for the drying of biologic substances.<sup>9</sup> There has been the tendency, in many instances, to consider drying of plasma as the best means of preservation. The advantages of preservation of plasma by keeping it in the frozen state and by drying have just been mentioned. Proper drying of plasma is at best a difficult and expensive procedure. It seems, therefore, useless to remove water from all plasma only to add it again when freezing is a method of preservation as good, and even better in most instances, and has the advantages of simplicity and economy. A critical comparison shows that the two methods have different

#### 9. These include:

- Elser, W. J.; Thomas, B. A., and Steffen, G. I.: Desiccation of Sera and Other Biological Products (Including Micro-Organisms) in the Frozen State with Preservation of Original Qualities of Products so Treated, *J. Immunol.* 28: 433 (June) 1935.
- Reichel, J.: U. S. Patent Rev. 20: 969 (Jan. 3) 1939.
- Floedorf, E. W., and Mudd, Stuart: Procedure and Apparatus for Preservation in "Lyophilic" Form of Serum and Other Biological Substances, *J. Immunol.* 29: 389 (Nov.) 1935; Improved Procedure and Apparatus for Preservation of Sera, Micro-Organisms and Other Substances—Cryochem. Process, *ibid.* 34: 469 (June) 1938; The Desicc. Process for Drying from the Frozen State, *J. A. M. A.* 115: 1095 (Sept. 28) 1940.
- Greaves, R. I. N., and Adair, M. E.: High Vacuum Condensation Drying of Proteins from the Frozen State, *J. Hyg.* 39: 413 (July) 1939.
- Hartman, F. W.: Use of Cellophane Cylinders for Desiccating Blood Plasma: Rapid and Bacteriologically Safe Method, *J. A. M. A.* 115: 1989 (Dec. 7) 1940.
- Hill, J. M., and Pfeiffer, D. C.: A New and Economical Desiccating Process Particularly Suitable for the Preparation of Concentrated Plasma or Serum for Intravenous Use: The Adverac Process, *Ann. Int. Med.* 14: 201 (Aug.) 1940.
- Edwards, F. R.; Kay, J., and Davis, T. B.: The Preparation and Use of Dried Plasma for Transfusion, *Brit. M. J.* 1: 377 (March 9) 1940.
5. British Reports obtained through National Research Council.
6. Alsever, J. B., and Ainslie, R. B.: A New Method for the Preparation of Dilute Blood Plasma and the Operation of a Complete Transfusion Service, *New York State J. Med.* 41: 126 (Jan. 15) 1941. Elliot, John; Busby, G. F., and Tatum, W. L.: Some Factors and Observations on Preparation and Preservation of Dilute Plasma, *J. A. M. A.* 115: 1006 (Sept. 21) 1940.
7. Clegg, J. W., and Dible, J. M.: Preparation and Use of Human Serum for Blood Transfusion in Shock, *Lancet* 2: 294 (Sept. 7) 1940.
8. Strumia, M. M.; Wagner, J. A., and Monaghan, J. F.: The Intravenous Use of Serum and Plasma, Fresh and Preserved, *Ann. Surg.* 111: 623 (April) 1940.

fields of application and that maximal benefit can be derived by the judicious selection of the one best suited for the needs.

Since, without doubt, the best methods of drying are from the frozen state, this suggests at once the possibility of combining the two means of preservation, whereupon plasma immediately after collection and pooling is frozen in a suitable container<sup>4c</sup> and kept in the frozen state. It may be then thawed and used, or, as the need and opportunity arises, dried from the frozen state.<sup>4d</sup> It may at this point be stated that drying of plasma with units of small capacity, such as would fit the needs of the average size institution, is neither practical nor economical.

It may also be stated that, for a hospital, drying of plasma is not necessary except for the already mentioned instances when administration of concentrated plasma is necessary or in rare cases of extreme emergency, when even a few minutes count. In this respect it is to be noted that it takes from two to five minutes to dissolve plasma dried from the frozen state, while it takes about twenty minutes to thaw frozen plasma.

For the average institution, keeping of plasma frozen at temperatures of  $-10^{\circ}\text{C}$ . or below is made practical and economical by a number of low temperature cabinets now on the market.

Even when large quantities and long distances are involved, the use of frozen plasma will in most instances constitute the method of choice for the preservation and distribution of the largest bulk of the material. This has been made practical of late by the great popularity of frozen food and therefore by the vastly improved facilities for low temperature storage, transportation and distribution, particularly by properly refrigerated trucks. The same considerations apply for ships at sea when they are equipped with facilities for the keeping of frozen food.

Frozen plasma, when rapidly thawed out and warmed to room temperature, may be kept in the liquid state without fibrinogen precipitation for at least several days. This suggests another simple and effective means of transportation and distribution. For example, plasma on request for use within twenty-four hours could be properly thawed out at the place of storage and then delivered in the liquid state and ready for immediate administration. Air transportation greatly increases the radius of useful and practical distribution. Beyond the period of forty-eight hours thawed out frozen plasma may be used, but filtration to remove fibrin may be necessary.

The legitimate field of usefulness of dried plasma in addition to the clinical conditions requiring plasma in concentrated form is in cases of adverse conditions of storage and transportation, such as may prevail in isolated areas not provided with means for keeping frozen plasma or too far to be provided by rapid transportation.

Dried plasma also serves a purpose of capital importance in furnishing a small reserve of material available for immediate use to units that may later on be provided with frozen plasma if the need for larger quantity arises.

The routine use of concentrated plasma in the treatment of shock<sup>10</sup> does not appear justified by (1) the acknowledged fact that, regardless of the initiating

factor, the essential lesion in shock is a decrease in volume of circulating blood; (2) our own experience;<sup>11</sup> (3) the experience of British workers.<sup>5</sup> The notable exception is that of shock with severe head injuries.

#### UNITS FOR THE PREPARATION OF PLASMA

From the foregoing considerations it appears desirable that each medical institution of sufficient size should be provided with means for the collection of blood, the separation, pooling and freezing of plasma and a means of maintaining plasma frozen at a temperature of  $-10^{\circ}\text{C}$ . or below. It is estimated that preservation of plasma in the frozen state would take care of at least 90 per cent of the needs of all institutions. The remainder of the plasma should be made available preserved in the dry form, for the purpose of concentration, for emergency cases requiring instantaneous restoration and for supplying the rare extrahospital cases when, because of various conditions, frozen or recently thawed plasma cannot be properly supplied.

For their needs of dried plasma, most institutions may either depend on apparatus of small capacity or partake of a cooperative plan whereby dried plasma is prepared in institutions provided with larger apparatus and properly trained personnel. The latter plan is by far the most desirable because of obvious technical and economic reasons. It requires considerable skill and supervision for the proper operation of a drying apparatus such as that used for drying in vacuo from the frozen state by condensation.<sup>4d</sup> In addition, particularly if mechanical refrigeration is employed, it costs much less per dose of plasma to dry in an apparatus of large capacity.

We thus come to consider (a) the majority of hospitals, where blood may be collected by a standardized method, plasma separated, pooled, frozen and kept in the frozen state, and (b) a smaller number of hospitals performing the same operations but on a larger scale and which in addition are equipped for the drying of plasma in large quantities, in the order of 25 to 50 liters weekly. These hospitals would act as "drying units" and provide the smaller hospitals with desiccated plasma.

The material to be dried can be transported to the "drying units" best as fresh citrated whole blood, preferably in a sufficient number of bleedings to make a suitable pool, usually ten. The material may also be transferred as fresh pooled liquid plasma or as frozen plasma in containers suited for drying.

When the material is delivered to the large drying unit as whole blood, the responsibility for separation, pooling, distribution in the final containers and sterility checks lies with the drying unit. The responsibility for the serologic studies for syphilis may be assumed by either the collecting or the processing unit. This exchange of containers and material between the collecting unit and the drying unit is made easy by the standardization of the apparatus and procedure for the collection, separation, distribution and preservation of plasma. A type of standardized apparatus and procedure has been offered.<sup>4</sup> This procedure features an 850 cc. cylindric bottle for the collection and centrifugation of citrated blood in the original container, separation, pooling and distribution of plasma by a closed method, followed by freezing and/or drying in standard receptacles.

10. Hill, J. M.; Muirhead, E. E.; Ashworth, C. T., and Tigertt, W. L.: Use of Desiccated Plasma, *J. A. M. A.* 116: 395 (Feb. 1) 1941.

11. Strumia, M. M.; Wagner, J. A., and Monaghan, J. F.: The Use of Citrated Plasma in the Treatment of Secondary Shock, *J. A. M. A.* 114: 1337 (April 6) 1940.

This bottle, as well as most of the other apparatus used in this procedure, is from stock material. The only improvement which appears desirable at this time after several months' experience is the construction of a similar but smaller bottle, of a capacity of 650 cc., on the assumption that it would fit a smaller and hence less expensive centrifuge.

A large "drying unit" following this standardized procedure would have a capacity sufficient to serve twenty to forty average size hospitals. By limiting to about half the number of institutions served there would be a reserve capacity which could be used for the drying of plasma in cases of local or national emergencies.

#### THE NATIONAL PREPAREDNESS PROGRAM AND THE SUPPLY OF PLASMA

While the methods of preparation and preservation of plasma and the institution of cooperative units for the drying of plasma just mentioned are essentially planned for use in civil life, they lend themselves well to supply the community in cases of local emergencies or the American Red Cross or the Army and Navy Medical Corps in case of national emergency.

This may be readily accomplished by the organization of many units for the collection of citrated blood preferably located in hospitals already having experience in this work. Once collected, the citrated blood from various units is immediately transferred to the nearest larger unit previously referred to as a "drying unit." There, plasma is separated by centrifugation, pooled, distributed in the final containers and frozen. Responsibility for serologic tests for syphilis as well as sterility and toxicity tests rests with the larger units. They also see to the preparation of the blood collecting apparatus and provide the technical supervision for the smaller or collecting units.

The plasma as prepared by the "drying unit" is turned over to government agencies in the frozen state for proper storage and distributed according to their need. The bulk of it can remain as frozen plasma in large and permanent storage places strategically distributed through the country. A smaller portion is dried and turned over to the same agencies for storage or distribution to meet immediate requirements of isolated or remote units or areas not conveniently provided with frozen plasma. The store of frozen plasma is always available for use or drying as desired.

The proportion of frozen and dried plasma is to be determined by the requirements as they develop. It is reasonable to assume, however, that it is safe and convenient to store a large portion as frozen material.

By the plan just outlined the responsibility for the quality and safety of the material rests with a relatively small number of units, which must be well qualified for the work.

The suggested plan, on a national scale, would call for a coordinated effort on the part of the Army and Navy Medical Corps through the intermediary of such organizations as the National Research Council and its committees, the American Red Cross and its branches and the physicians and nurses of the various hospitals throughout the country acting as collecting and processing units. More specifically, the Army and Navy would state their need and lay down their requirements, the National Research Council would act to advise, organize and supervise concerning the technical details, and the Red Cross and its branches would attend to

the organization and calling of volunteer blood donors. This plan has been experimentally operating in Philadelphia and Bryn Mawr since September 1940. The apparatus used and the technic followed are described in detail separately.<sup>4</sup> The results have been satisfactory so as to justify the suggested expansion of the plan outlined.

#### SUMMARY AND CONCLUSIONS

Considerations concerning the physiologic action of the various components of blood has led, of recent years, to the increasing use of citrated plasma as a substitute for whole blood transfusion. Clinical experience has fully confirmed the efficacy and safety of this material in a variety of conditions.

Technically, citrated blood plasma offers considerable advantages over whole blood, especially in the matter of preservation and ease of administration.

The choice of a method of preservation is a matter of primary importance. Storage in the liquid state is to be discouraged, because of the opportunity for bacterial growth and continuous deterioration of many essential elements as well as precipitation of fibrinogen.

The difficulties encountered in the storing of citrated blood plasma in the liquid state are completely eliminated by collection of blood, separation and pooling of plasma by a rapid closed method, followed by immediate freezing and preservation in the frozen state. This method of preservation is both simple and economical and provides optimal preservation for such labile elements as prothrombin, complement and fibrinogen. Preservation in the frozen state is the method of choice, adequate to supply the majority of needs of most hospitals.

Plasma preserved by freezing may at any time be dried from the frozen state. Dried plasma is of advantage in cases requiring concentration, such as cerebral edema, and in instances necessitating storage, transportation and administration under adverse conditions. It is estimated that, of all the plasma used, not more than 10 per cent needs to be dried.

Almost every hospital should be equipped to prepare and store plasma in the frozen state. It is not practical or necessary for the average hospital to dry plasma for its own needs. A few larger hospitals selected for their capability and with regard to the density of the population and means of transportation should be equipped to dry plasma from the frozen state, in quantity far exceeding their own needs. Thus they would be in a position to act as "drying units" for a large number of smaller institutions on a cooperative, non-profit basis.

These units would work at considerably less than full capacity. Thus not only would they be able to meet the ordinary requirements of civil life but they could be readily expanded to take care of local and national emergencies of civil and military nature. Under the conditions created by a national emergency, the securing of donors becomes a major problem, best handled by the American Red Cross. Bleeding of donors and processing of plasma should be done with the technical advice and under the supervision of a centralized authority, such as the National Research Council acting through its various committees. The bulk of plasma thus secured could be stored and distributed as frozen plasma. A certain portion of this could be dried by the units mentioned in anticipation to the expected needs.



## PHYSICAL FITNESS

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Kessler<sup>1</sup> has drawn attention to the importance of attaining clarity with regard to the objectives of physical fitness. In fact, few basic medical terms are equally vaguely defined and similarly loosely used. Of the many aspects of fitness, we intend to deal in this paper with only one: that of physical efficiency. The fundamental importance of this problem has not yet been fully recognized by the medical profession. It is insufficiently realized that the standard of physical efficiency dictates largely the rate of industrial and agricultural production, that it is one of the primary determinants of military preparedness, that it has a bearing on the health of the nation and that it influences the rate of progress of education.

One of the main reasons for the difficulty of giving a clear definition of the term physical efficiency is lack of quantitative information on the subject. In his "Theory of Heat," one of the classics of modern physics, James Clark Maxwell<sup>2</sup> stated in 1871:

The most important step in the progress of every science is the measurements of quantities. Those whose curiosity is satisfied with observing what happens have occasionally done service by directing the attention of others to the phenomena they have seen; but it is to those who endeavor to find out how much there is of anything that we owe all the great advances in our knowledge. Thus, every science has some instrument of precision, which may be taken as a material type of that science which it has advanced, by enabling observers to express their results as measured quantities. In astronomy we have the divided circle, in chemistry the balance, in heat the thermometer, while the whole system of civilized life may be fitly symbolized by a foot rule, a set of weights and a clock.

"The 'instrument of precision' in the new science of labor is physical performance. The quantitative definition of a muscular action alone can be accepted as a measure of efficiency.

## THE ECONOMIC ASPECT

In a recent study conducted in collaboration with Goedvolk and de Jongh we investigated the effect of a special training course on the health and economic situation of substandard recruits. Unemployment and unemployability, the latter question being closely related to that of the "poor whites," are serious problems in the Union of South Africa.<sup>3</sup> Between 1935 and 1936, when this country experienced an unprecedented economic expansion, 118,939 persons were unemployed.<sup>4</sup> These figures must be considered in the light of the fact that the entire European population in South Africa amounts to a little less than two million and that unemployment figures among the eight million Negroes in this country

have not been included. It is therefore obvious that the practical importance of the results obtained in our survey is considerable.

## UNEMPLOYABILITY

The investigations to which we refer were conducted on a sample group of 32 young men who, during the 1935-1936 period of economic expansion, were unable to obtain or retain employment. According to the standards stipulated by labor and recruiting offices, as well as by the medical corps of the army, they were "fit." All of them had received primary education; they did not suffer from visible ailments such as manifest syphilis, flat feet or bad teeth, which according to the regulations, would have branded them "unfit." Nevertheless, most of them were unemployed or were working under conditions which were economically and otherwise unsatisfactory at a time when the labor market was flooded with demands for workers; for various reasons they seemed to be unemployable, or at least unable to find positions which suited them or for which they were suited.

What were the reasons for their plight? Tests of physical performance demonstrated that the power of endurance, the strength and the skill of these young men were low. As their poor educational qualifications rendered most of them unsuitable for anything except manual labor, their physical weakness represented a severe handicap. Some of the trainees had previously worked for short periods on farms but had lost their positions because of their insufficient capacity for physical labor. Their state of unfitness, which had not been "officially noticed" by the various authorities with whom they had been in contact, was also responsible for the mental dullness and for the lack of inner discipline which were found in an alarmingly large number of the recruits prior to their training course. The incidence of minor illnesses, such as colds, pain in the back, rheumatism, constipation, sore throats and headaches, was high. On account of their bad posture and lax general bearing, they made a bad impression on every employer.

All these factors combined to handicap these people in the economic field. Surely, they were "unfit," even if their official records did not state it. They were in a vicious circle. Their unfitness hampered their occupational career. They thus were kept on a subeconomic level of existence. Their poverty was responsible for an unsatisfactory diet, for bad housing and for poor general conditions of living. Their mental attitude became bitter. Few of them had sufficient initiative left to make an attempt at rescuing themselves from what in many cases appeared to be a hopeless situation.

## SPECIAL TRAINING CAMP

A short time ago it was decided to establish a special battalion at military headquarters of the South African Defense Force at Roberts Heights "for the purpose of combating the deteriorating influence of unemployment,

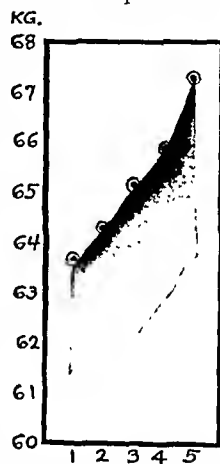


Fig. 1.—Increase in body weight during a six months course (five measurements taken before and at six week intervals during the course). Means from thirty-two measurements.

The investigations to which reference has been made in this paper are being aided by a grant from the South African Research Council and Board, by the Secretary for Public Health, the South African Institute of Medical Research and the Witwatersrand Technical College.

1. Kessler, H. H.: Determination of Physical Fitness, J. A. M. A. 115: 1591 (Nov. 9) 1940.

2. Maxwell, J. C.: Theory of Heat, London, Longmans, Green & Co., 1888, chap. 4, p. 74.

3. The Poor White Question in South Africa, in Report of the Carnegie Commission, 1932, vols. 1-5.

4. Report of Department of Labor, for the Year Ending 31st December, 1939, Union of South Africa, 1940.

and of providing discipline and training for unemployed boys and young men."

A strong effort was made by the departments of labor and defense, which collaborated in rural areas with the police authorities, to recruit young men of the type just described between the ages of 17 and 22. The minimum requirements were a primary school education and freedom from "disabling or infectious" disease. The young men underwent a six months course of training under military discipline, during which stress was laid on physical training and drill. Careful attention was paid to the diet, general living conditions and recreation of the recruits.

Fig. 2.—Drop of resting pulse rate during six months' training (five measurements taken before and at six week intervals during the course). Means from thirty-two measurements.

Our investigation was conducted with one of the first groups trained under this scheme. Physiologic, postural and anthropometric tests were undertaken before and at five stages during the six months course. The results of these studies were correlated with those of tests of athletic performance. This enabled us to assess critically the effect of the course on the working capacity of the trainees.

The results of the six months course on the recruits were truly remarkable. It is no exaggeration to say that the training transformed substandard youths, many of them of the poor white type, into normal young men. We can produce twofold proof for this statement: First, there is the medical evidence and, second, the economic result.

#### THE PHYSICAL EFFECTS

We can cite the results of our physiologic, anthropometric, postural and performance tests which demonstrate the rapid rise of different substandard conditions toward normal levels. Static phenomena such as posture, weight and resting pulse rate (figs. 1 and 2) as

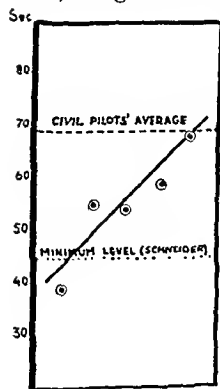


Fig. 3.—Improvement of breath-holding time from substandard level during six months' training (five tests taken before and at six week intervals during the course). Means from thirty-two measurements.

well as functional reactions such as breath-holding time or the post-exercise decline of vital capacity, were studied at various stages of the training course, and the increase in organic efficiency could thus be quantitatively ascertained (figs. 3, 4 and 5). Working performances of the recruits, e. g. their 3 mile running times, showed a highly significant improvement (fig. 6). Their general attitude, physical as well as mental, changed during the training course (fig. 7). They no longer gave the impression of being "dull." They were dressed in well fitting uniforms which contributed to their looking "smart." They understood questions and had learned how to answer if spoken to.

#### THE ECONOMIC RESULT

Light was thrown on the practical importance of the physiologic effects of the training by an analysis of the economic position of the trainees before and after

the course. A labor bureau which was attached to the office of the commander of the training camp was able to provide for 90 per cent of the recruits who participated in the special training courses suitable employment at standard wages as paid to skilled European workers or apprentices in this country. During the period 1933 to 1939, 9,409 out of 10,735 "Special Service Battalion" recruits thus obtained employment. An analysis of the pay sheets for the first four years of employment of a sample group of these formerly dissatisfied, unemployed or unemployable workers revealed that the training, by rendering them physically fit, had really achieved their full economic rehabilitation. A widespread and serious social disease had been cured.

It is important to realize, at this stage, that it was primarily due to a new, unprejudiced and unorthodox definition of the term physical fitness that care could

be taken of this large group of persons. Many of them would have remained in a hopeless position if the current medical concept had been rigidly adhered to, according to which they had been labeled "fit."

#### THE PHYSIOLOGIC GROWTH OF PHYSICAL EFFICIENCY

During the last few years we have conducted a study of the growth of physical efficiency in children between 5 and 20 years of age. This investigation, which is based on more than twenty thousand individual tests, forms part of the malnutrition survey which one of us (Cluver) has organized on behalf of the government of the Union of South Africa. We decided to undertake this extensive survey because we were convinced that physical efficiency determines to

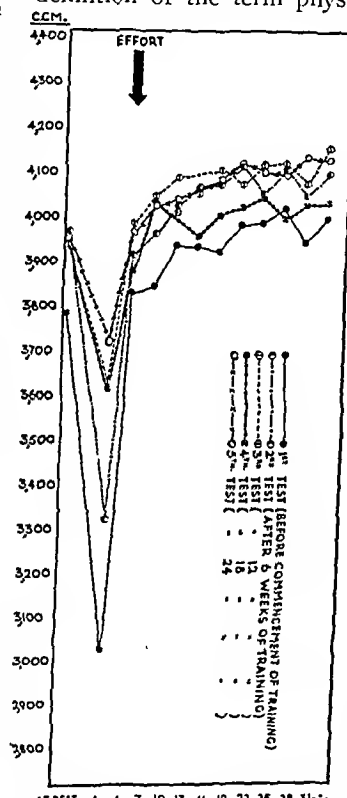


Fig. 4.—Response of vital capacity to a standard exercise (forty bendings of the knee in one minute) as tested before and during a six months training course.

a considerable extent the degree of "fitness" as it is understood under conditions of everyday life. The tests to which we refer here were conducted with English, Afrikaner, Jewish, Bantu, Cape Colored, Indian and Chinese children, who were subjected to three tests which had been selected with a view to ascertaining in exact terms the potentials of physiologic performance of the three basic constituents of labor—skill, strength and endurance. The children had to run 100 yards, put the 10 pound iron shot and cover the relatively long distance of 600 yards. Each performance was measured and recorded. The results were statistically analyzed.

#### RACIAL EQUALITY

We believe that this investigation has been the first of its kind, and some of the results obtained, therefore, have broken new ground. First of all we were impressed

with the similarity between the standards of physical performance found in the different racial groups. No more impressive evidence for the basic equality of man has ever been adduced (fig. 9). Second, we noticed that in our material biologic factors influenced the growth of physical efficiency more profoundly than environmental ones, although the potential interference of the latter must not be underrated.

We shall cite a few examples.

#### POWER OF ENDURANCE

The power of endurance of boys, as expressed in the progress in performance of the 600 yard running times, increases steadily within the age limits of our experimental material (fig. 10). The power of endurance of girls before puberty is about equivalent to that of the boys; it reaches an absolute maximum at the age of 13 years after which it declines. Thus Bantu girls of the group aged 18 to 20 are back on or below the level of performance of girls aged 6 to 7 years.

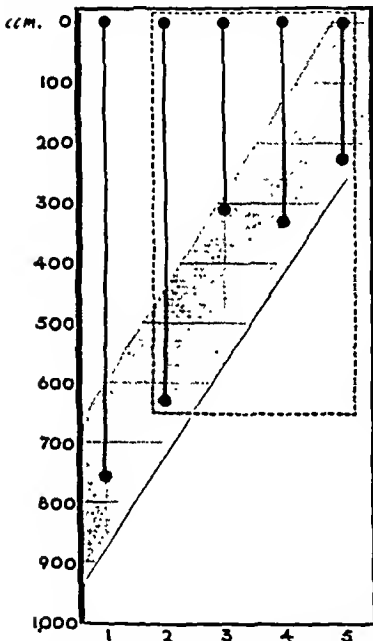


Fig. 5.—Continuous postexercise decline of vital capacity during training. The amount of postexercise decline of vital capacity is a valuable indication of the state as well as of the rate of improvement of respiratory fitness. While before training the vital capacity of our recruits decreased after the standard exercise by about 750 cc., the corresponding figure after six months' training was 220 cc. (Five tests were taken before and at six week intervals during the course.) Means from thirty-two measurements.

labor, these physiologic features are expressed directly in terms of labor output and earning power of workers. On the sugar plantations of Natal (South Africa) unskilled Indian and Bantu agricultural laborers are being paid according to the number of yards of cane rows which they weed in a working day. In a sugar field of medium height, men finish about 1,000 yards a day. They receive a monthly wage of between 25s. 0d. and £2 10s. 0d. (\$9.06 and \$10.07). Women weed between 500 and 700 yards a day and receive between £1 0s. 0d. and £1 5s. 0d. (\$4.03 and \$5.03) a month. Children over 12 years of age, who weed 300 to 400 yards a day, receive 10s. (\$2.01) a month. Children under 12 years are not accepted.

Actually, the power of endurance of the latter group is far superior to that of the older ones: Among 1,877 children of different racial extraction in the group aged 4 to 6 years only 24 failed to complete the 600 yard running race in our tests. Out of 1,260 girls of the group aged 16 to 20 years 801 gave up or refused altogether to take part in the long distance running test. In sharp contrast to what is generally believed, our investigations have conclusively proved that working endurance as a basic physiologic phenomenon is greatest in young children (fig. 11).

We have recently demonstrated how, under primitive conditions of

In other words, the rates of growth of physiologic efficiency, of labor output and of earning power run parallel. This, to our knowledge, is the first example of a direct interdependence between physiologic and economic factors.

#### PUBERTY

Another important biologic event which exerts a profound influence on physical efficiency is puberty.

Although this influence is noticeable in boys as well as in girls, its effects are greatly different in the two sexes. In growing boys it retards the rate of progress in performance without interrupting it. In girls it practically brings the developmental progress of physical efficiency to a standstill; with regard to certain performances, e. g. those demanding endurance, it even initiates a decline. The only exception to this rule is that strength might still increase after puberty. As performances such as putting the shot, which we used as a test of strength, are largely a function of body weight, the postpuberal improvement in this direction can easily be explained. The girls gain weight and thus improve their performances. However, if one takes all the results of the different tests of performance into consideration, one can state that in girls puberty terminates the growth of physical efficiency<sup>5</sup> (fig. 12).

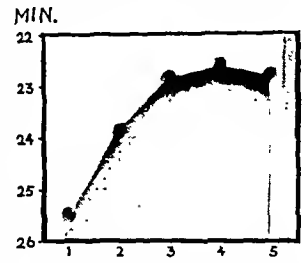


Fig. 6.—Improvement of 3 mile running times during six months' training (five tests taken before and at six week intervals during the course). Means from thirty-two measurements.

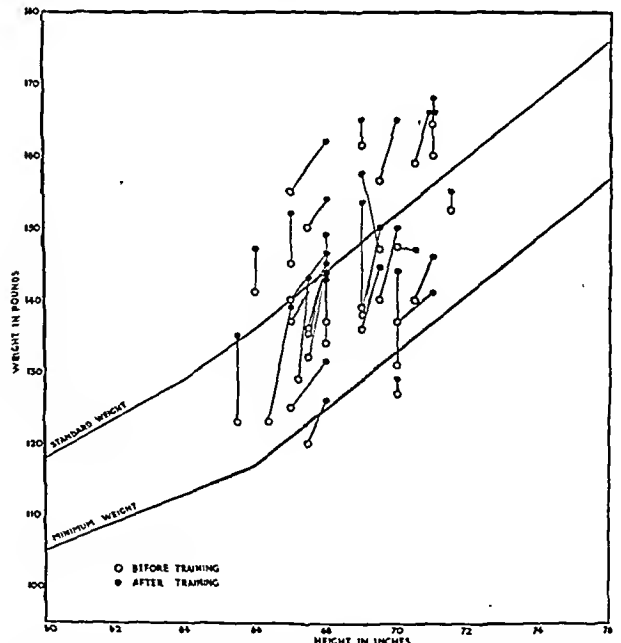


Fig. 7.—Effect of a six months training course on height-weight correlations of 3 substandard recruits. The lines indicating minimum and standard levels in this chart and in figure 8 correspond with the requirements laid down by the United States Army Recruiting Office.

#### ADAPTATION ENERGY

We have based our interpretation of the effects of puberty on the growth of physical efficiency on the

5. We wish to emphasize that our tests have been conducted with children who had not previously undergone physical training. Thus we are dealing only with the problem of physiologic growth of physical efficiency. The question of the educability of children in standards of physical performance is not discussed in this paper.



important experimental work conducted during the last five years by Selye.<sup>6</sup> This author has demonstrated that in addition to being able to effect specific physiologic adjustments the organism possesses a certain amount of "adaptation energy" which is mobilized in various emergencies. This reserve force may become exhausted if there is a simultaneous occurrence of more than one emergency. Selye's animals were able to overcome the effects of exhaustive physical exertion. They survived a specified period of exposure to extreme heat. They successfully fought against a well defined threshold dose of atropine. However, the animals died if they were compelled to perform the same amount of exhaustive exercise shortly after having recovered from poisoning with atropine. They died when they were exposed to the same hot environment from which they previously had escaped alive if the experiment was repeated with animals who had completed the exercise test.

In other words, we have to assume the existence of a nonspecific factor which enables a person to cope with emergencies provided such emergencies befall the person as single events. Should several emergencies arise at the same time, permanent damage or even death may be caused by the combination of factors each of which alone would have been harmless.

There can be no doubt that both puberty and physical activity represent physiologic "strains" which are capable of taxing the adaptation energy of the body to the utmost. The fact that we can demonstrate, during puberty, a physiologic tendency toward slowing down

unnecessarily strenuous activities such as rigid drill; as well as other physical efforts which lay undue stress on the reserve energy of the body, must be avoided.

#### NUTRITION AND PHYSICAL EFFICIENCY

In spite of its practical importance, little evidence has yet been presented with regard to the relationship

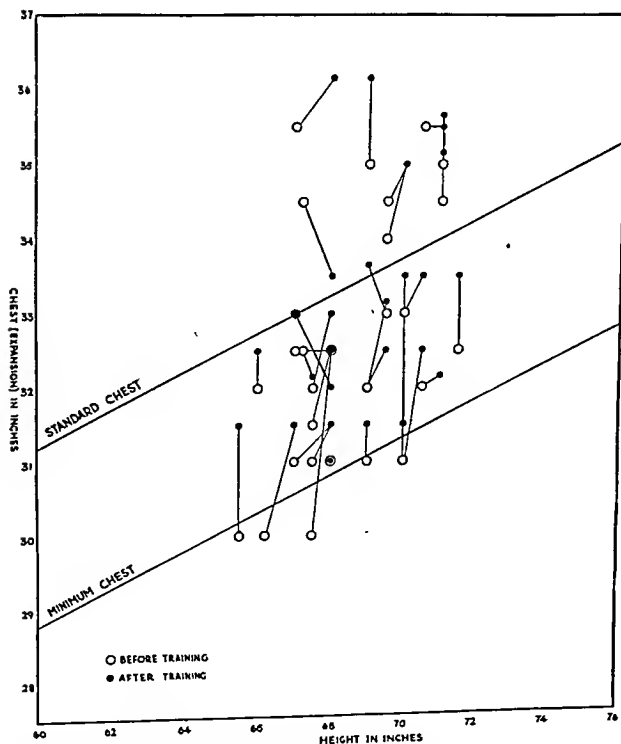


Fig. 8.—Effect of a six months training course on height-chest circumference correlations of 32 substandard recruits.

or even toward a temporary or final interruption of the growth of physical working power must be interpreted as an important biologic hint: During puberty,

6. Selye, Hans: The Alarm Reaction, in Piersol, G. M., and Bortz, E. L.: *Cyclopedia of Medicine, Surgery and Specialties*, Philadelphia, F. A. Davis Company, 1940, vol. 15; *Studies on Adaptation, Endocrinology* 21: 188 (March) 1937; *Experimental Evidence Supporting the Conception of "Adaptation Energy,"* *Am. J. Physiol.* 123: (Sept.) 1938.

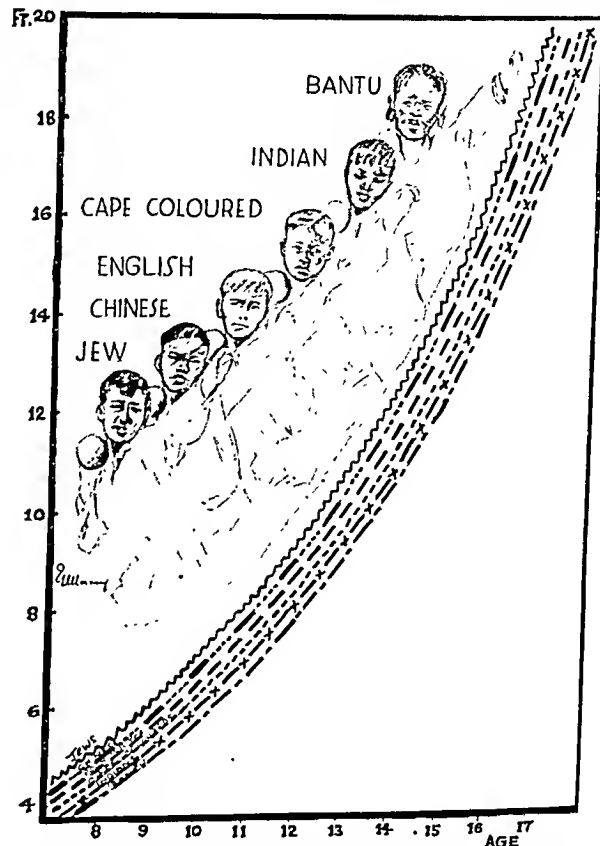


Fig. 9.—The physiologic growth of strength, as expressed by the progress of performance in shot putting, tested in English, Jewish, Cape Colored, Indian, Bantu and Chinese children between 6 and 16 years of age. There was an astounding similarity of the age performance standards as well as of the rates of growth of efficiency in the various racial groups. The Jewish boys were leading by a slight margin, probably because they mature a little earlier.

between nutrition and physical efficiency. During recent years numerous valuable clinical contributions to the subject have been made. But little is known about the effects on physical efficiency of physiologically deficient diets of the kind consumed by the working population all over the world. On previous occasions we have drawn attention to the paradoxical fact that it is the class of badly nourished people, of the white, black, brown and yellow carbohydrate eaters, who perform the bulk of manual labor on the six continents of the globe. While this observation certainly does not indicate that such a state of affairs should be regarded as satisfactory, this is surely a physiologic phenomenon of supreme interest.<sup>7</sup>

#### STANDARDS OF PERFORMANCE OF POOR CHILDREN

In the course of our investigations of the physiologic growth of physical efficiency, we have paid special attention to the question whether poverty, with its unfavorable effect in nutritional standards, causes a

7. Cluver, E. H., and Jokl, Ernst: A Survey of Physical Efficiency in South Africa, read before the 1940 annual meeting of the South African Association for the Advancement of Science, Johannesburg, July 1, 1940; *South African J. Sc.*, 1941.

deterioration in physical efficiency. We have compared the athletic performances of children of economically well situated parents with those of extremely poor ones. The tests on which the following statements are based were conducted on the pupils of the primary and secondary schools, respectively, in George (Cape Province). The pupils of the primary school came from extremely poor homes. Although none of them can be said to have suffered from caloric starvation, they lived mainly on a carbohydrate diet—maize, bread and potatoes were their daily fare—which was supplemented by little meat and scarcely any dairy products; however, a fair amount of fresh fruit and vegetables was available. The general conditions of living of this group were bad, and many of the children worked in their spare time on their parents' farm holdings. The children of the secondary school came from economically better situated homes; their general education and the standard of their environment were higher; their diet was better balanced, containing a satisfactory proportion of meat, dairy products and fresh fruit and vegetables.

In the prepuberal age groups we found no difference in physical efficiency between the two groups. After

who fixed a ski on his prosthesis and of a girl athlete whose left leg had been rendered 5 cm. short by the resection of a tuberculous hip joint. We have investigated numerous instances of professional boxers who

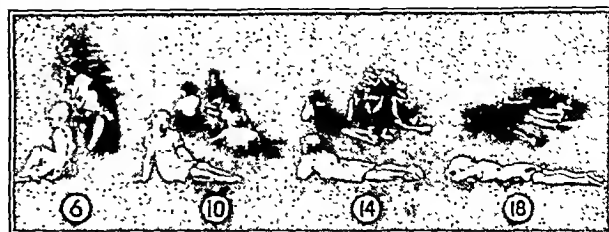


Fig. 11.—Effect of running 600 yards (endurance test) on girls of different ages. A study of the reactions of the children to the standard test has shown that the absolute running times are not the only criteria of their physical efficiency. After running 600 yards, girls of 6 years of age recover within two to five minutes; they sit at ease. Girls of 10 feel much more tired after the same performance; their breathing is strained; for a few minutes they are unable to talk; they support their trunks on their outstretched arms; the time of recovery is much longer than in the former group. Girls of 14 are uncomfortably tired after the 600 yards test; most of them lie down; their respiration is forced; pulse rates of 180 are not uncommon; within the ensuing hour girls of this group will not attend to ordinary work. After the same running performance, girls of 18 are exhausted; they frequently are in a condition approaching collapse; as a rule they flop to the ground and lie flat; their breathing is rapid and shallow; they cannot lift their heads; many of them will say that they actually have a feeling of suffocation; some vomit. If they try to stand up they may faint, i. e., vasomotor collapses. For hours, often even for the rest of the day, they feel weak, tired and incapable of doing any physical or scholastic work.

suffered from advanced cerebral disease caused by innumerable blows to the head, yet whose standard of physical fitness, as measured in terms of "fighting trim," was extraordinary high.<sup>8</sup> We have recently observed

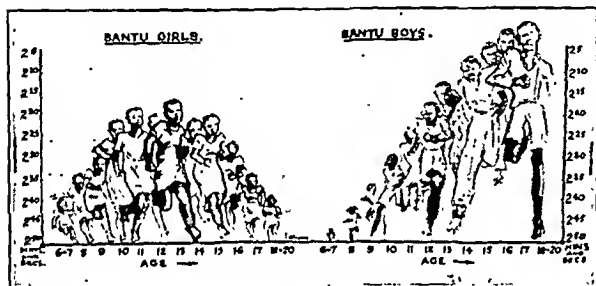


Fig. 10.—This graph is based on the results of tests of running 600 yards conducted with 482 Bantu girls and 571 Bantu boys between 6 and 20 years of age. The children were altogether untrained. The different developmental trends in the two sexes are obvious. In both groups there is an increase in endurance between 6 and 13 years of age. The endurance of the girls, as indicated by their running times, may even surpass that of the boys, as in this instance. From 13 years onward, however, a profoundly different development occurs in boys and girls. The girls show a rapid decrease of endurance, while the boys' running times continue to improve steadily. Thus girls of the group aged 17 to 20 years achieve the same running times as those 6 to 8 years old. Actually, young children are greatly superior in endurance to older ones.

puberty, however, there was a striking difference in the course of growth of physical efficiency between the "rich" and the "poor" children, the latter's standards of performance dropping below those of the former.

It thus appears that unless nutritional conditions are physiologically unbearable, e. g. if true clinical deficiency states are produced, the organism is capable of upholding, during the years of growth, a normal level of physical efficiency. Puberty, however, represents such a powerful additional strain that under the same dietary regimen normal standards or a normal rate of growth of physical efficiency can no longer be maintained. Either the quality of the diet is improved or working capacity decreases.

#### SOME CLINICAL ASPECTS

For a number of years we have published a large selection of case histories of athletes which demonstrate the fallacy of many generally accepted clinical concepts of the relationship between disease and physical efficiency.

We have described the case of a champion swimmer with dementia paralytica, of a first class ski-runner whose left leg had been amputated above the knee and

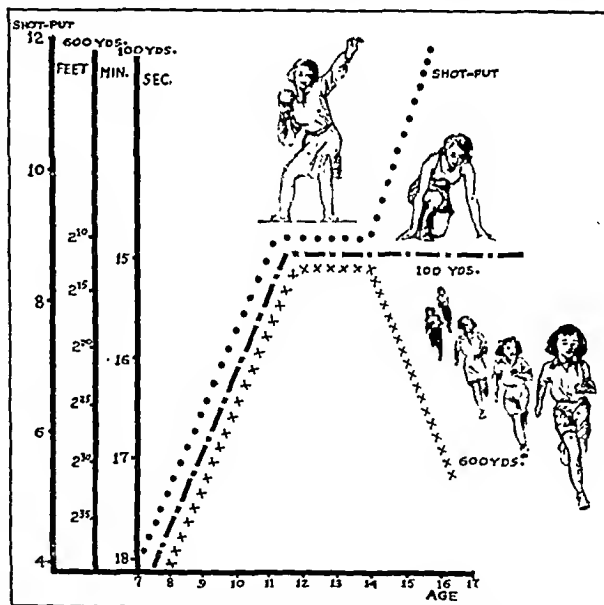


Fig. 12.—In women, the three components of physical efficiency in performance—strength, skill and endurance—grow at a steady rate from childhood to about the age of 12 years. At this stage, the onset of puberty causes a sudden interruption of this phase of development, and the prepubertal level of efficiency is maintained unchanged for about two years. After puberty, a characteristic differentiation of growth in performance occurs: Skill remains stationary. There is a gain in strength, explained by the increase in body weight and muscular development. Endurance, however, declines. Girls of the group aged 16 to 20 years have an endurance equal or even inferior to that of children of the 5 to 9 year class.

a gymnastic instructress with myasthenia gravis who, when taking a prostigmine preparation, could continue her professional activity; a shot-put champion with a

8. Jokl, Ernst: The Medical Aspect of Boxing, Pretoria Union of South Africa, J. L. Van Schaik, 1941.

congenital defect of the major pectoral muscle on the right side<sup>9</sup> (fig. 13), an excellent runner with advanced syphilitic osteopathy of both tibias (fig. 14) and a girl aged 18 years with paralytic and paretic remnants of poliomyelitis affecting the right thigh, lower leg and foot, who ranked among the leading long distance swimmers in her town.

We have paid special attention to the hitherto much neglected problem of the effects of cardiovascular disease on physical efficiency. We have reported the case of a marathon runner with aortic regurgitation and mitral stenosis.<sup>10</sup> We have studied in detail the 25 athletes with aortic regurgitation. An analysis of the occurrences of fatal collapse during exertion revealed that circulatory disease, even if so severe that it acutely threatens life, often does not at all impair physical efficiency. In fact, we have encountered several examples of famous sportsmen dying from long-existing circulatory illness during or shortly after having successfully taken part in competitive athletic events.<sup>11</sup>

Among the 67 deaths during or after exertion on which our analysis was based was that of a first league football player who died after a game; autopsy revealed advanced lipoidosis of the intima of the aorta, of the aortic valves and, most severe, of the coronary arteries. A tennis champion died after a match from rupture of the aorta. Two runners dropped dead on the track in whom necropsy revealed, respectively, rupture of an aneurysm into a tuberculous pulmonary cavity, and aortic stenosis, chronic endocarditis and an organized thrombus in the right branch of the coronary artery. A competitor in a long distance race died from mesoarteritis syphilitica: The superior portion of the ascending aorta was dilated and the intima roughened; there were numerous whitish scars in the thickened aortic wall, yellow spots covered the media, the coronary ostia were greatly narrowed and the coronary lumens were much decreased.

A few months ago we analyzed 2 cases in which death occurred during exertion, both of apparently healthy

myocardium, in which muscle fibers were replaced in many spots by fibrous tissue, and an extraordinarily narrow coronary artery (figs. 15 and 16). The other was a Rugby player who died after a test game. He had a cystically degenerated right kidney the size of a walnut, a greatly hypertrophied left kidney, a much



Fig. 14.—Legs of Indian child with osteopathy of syphilitic origin. This patient was discovered in the course of athletic tests conducted with school children. The child, who had no complaints whatever, is an excellent runner.

enlarged heart with a degenerated myocardium and thick, prominent, atheromatous patches in the coronary arteries and a hypoplastic abdominal aorta. There was a persistent thymus, in which microscopic examination revealed much active tissue. On account of his outstanding feats on the playing field the deceased had been called "the iron man of South African Rugby football."<sup>12</sup>

We do not look on experiences of this kind primarily as curiosities. Such observations teach us rather that many of our present concepts of physical efficiency and fitness need to be revised, that the limits of plastic adaptation of the human organism are much wider than is generally believed, that physical training, as clearly distinguished from "remedial work," must be elevated to a fully recognized branch of medical therapeutics in order to achieve the desirable results but that it is necessary to state for each condition and for each case whether it is medically possible to tax the person's potential of adjustment to the utmost.

One of us (Jokl) has recently been asked by the Defense Department to place experiences of the kind described at the disposal of a special battalion which treats, as well as trains and develops to the limit of their efficiency, recruits who for medical reasons do not satisfy the demands stipulated by the Army Recruiting Office. Highly trained physical training instructors and physical therapists are attached to this battalion, and closest collaboration is maintained with the various clinical branches of the Army Medical Corps. Most



Fig. 13.—Champion in shot putting, with congenital absence of the right pectoralis major muscle. (The man is right handed.) Note the total lack of hair over the right side of the chest.

persons. One was a young woman who died during a dance. Autopsy revealed the rare condition of congenital subaortic stenosis, advanced hypertrophy of the

9. Jokl, Ernst: Congenital Absence of Pectoral Muscle, *Brit. M. J.* 1:1156 (June 3) 1939.

10. Jokl, Ernst, and Suzman, M. M.: Aortic Regurgitation and Mitral Stenosis in a Marathon Runner, *J. A. M. A.* 114:467 (Feb. 10) 1940.

11. Jokl, Ernst, and Melzer, L.: Acute Fatal Nontraumatic Collapse During Work and Sport, *South African J. M. Sc.* 5:4, 1940.

12. Cluver, E. H., and Jokl, Ernst: Sudden Death of Football International After Test Game, *Am. Heart J.*, 1941, to be published.

of those who were formerly rejected are now reclaimed and conditioned by a combined medical and physical educational effort; we thus transform second rate raw material into the finished product of trained soldiers and workers.

#### CONCLUSIONS

In the future if we speak of fitness and efficiency we shall have to ask ourselves Fitness and efficiency for what? A man may be fit as a paper hanger without being fit to decide the destiny of a continent. Lange<sup>13</sup> has described the history of a habitual criminal who became a celebrated hero under conditions of war. Some people are efficient piano players but are unfit to work as miners. Others are physically capable to do clerical work in a city but would be "lost" on a farm. A man without legs is unfit for walking but may be an outstanding fighter pilot.

Problems of this kind have their medical aspect as well as their economic, educational and social aspects.

Theories on and concepts of physical efficiency will automatically change when more physiologic and clinical experiences in this field are presented in the medical literature. This, however, will be possible only if the amount of research conducted on this subject is in accordance with its practical importance.

Finally, we wish to express the belief that a closer study of the medical aspect of physical efficiency will introduce a new dynamic concept into clinical medicine.

the extent to which functional adjustments are possible in the healthy as well as in the diseased human organism; it will thus take medicine further away from an era in which anatomic changes are regarded as the sole criteria for the interpretation of physiologic and pathologic conditions.



Fig. 16.—Extent of the infiltration of fibrous tissue in the heart muscle shown in figure 15 (stained with van Gieson stain and hematoxylin). The condition of the heart muscle was responsible for the fatal collapse of the young woman. It did not, however, prevent her from exercising and indulging in strenuous physical activities right up to the time of her death.



Fig. 15.—Heart of 16 year old girl who died during a ball after having danced for four hours: A, open ductus arteriosus; B, subaortic stenosis; C, greatly hypertrophied myocardium.

Such a study will develop a strong sense of reality by placing the medical implications of economic, social and educational problems in their correct perspective. It will facilitate new applications of physiologic information to hitherto neglected clinical issues. It will show

#### SUMMARY

1. Closer study of medical problems of physical fitness is to be encouraged.
2. Experimental results have thrown light on the relationship between physical fitness and employability.
3. The physical improvement of substandard recruits obtained in a six months training course and the economic implications of such improvement are noteworthy.
4. An interracial survey of the physiologic growth of physical efficiency, conducted with English, Afrikaner, Jewish, Bantu, Cape Colored, Indian and Chinese children, revealed a striking similarity between the standards of physiologic performance of the different racial groups.
5. The effect of puberty on the growth of physical efficiency is noteworthy. It is desirable to collect more evidence on the relationship between subclinical nutritional deficiencies and physical efficiency.
6. Clinical evidence demonstrates the fallaciousness of many accepted clinical concepts of the relationship between disease and physical efficiency.

**The Father of the Empirical Scientific Method.**—Francis Bacon (1561-1626), the Lord Chancellor of England in the reign of Queen Elizabeth, is known as the father of the empirical scientific method. For the first time he logically formulated the inductive law of scientific discovery. This law sought to discourage the custom of seeking theological or metaphysical explanations for natural phenomena and to encourage the limitation of science to the facts of experience. He advocated replacing faith and belief with doubt and inquiry, and urged the student to utilize his senses and reasoning powers in observation and experiment and thus to acquire a knowledge of the universe. His rules for scientific observation and experiments are well known to all scientists, and in this way he exerted an influence on psychiatric thought as well as on all medicine.—Lewis, Nolan D. C.: *A Short History of Psychiatric Achievement*, New York, W. W. Norton & Co., Inc., 1941.

13. Lange, Johannes: *Kriminalität-Heldentum-Fürsorge*, Psychiat.-Neurol. Wchnschr. 32: 500, 1930.

OSTEOMYELITIS OF THE FEMORAL  
NECK AND HEADCAUSED BY BACTERIUM NECROPHORUM  
(BACILLUS FUNDULIFORMIS)

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AND

VIRGINIA M. BREAKS, A.B.

CHICAGO

The group of nonsporulating anaerobes described in the literature under the names *Bacterium necrophorum*, *Bacillus funduliformis* and a number of others has been found in various pathologic conditions in man and animals. These conditions include septicemia, abscesses of the liver, lungs and subcutaneous tissues and inflammations of the joints. In a comparative study by Dack, Dragstedt and McCullough<sup>1</sup> the strains from diseases in man, represented by *B. funduliformis*, have been shown to present no clearcut differences from the strains reported usually in animal and occasionally in human disease and represented by *Bact. necrophorum*. Dack

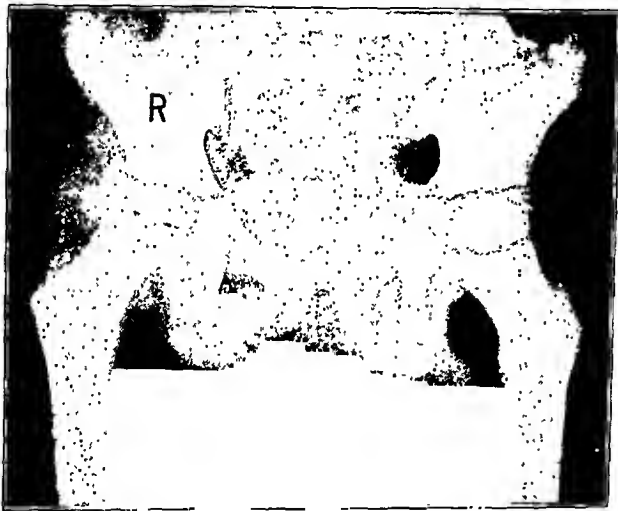


Fig. 1.—Appearance, Oct. 15, 1937, five days after admission. Thinning of joint space is evident.

and his associates,<sup>2</sup> describing these organisms in their studies of ulcerative colitis, placed them in the genus *Bacterium*, since they lack a characteristic of the genus *Bacillus*, the ability to form spores. These workers retained the name *Bact. necrophorum* on the basis of priority.

The literature on these nonsporulating anaerobes has been reviewed in a book by Weinberg and his associates<sup>3</sup> and in an article by Brunner.<sup>4</sup> Numerous additional reports, the majority of them reports of septicemias, have appeared since these reviews were written. Two of these articles<sup>5</sup> dealt particularly with

the surgical aspects of infections due to these anaerobes. It is significant that pyarthrosis was mentioned as occurring frequently. Our search of the literature failed to reveal any case of osteomyelitis due to *B. funduliformis* or *Bact. necrophorum*. One fatal instance of osteomyelitis due to a closely related strain, *Bacterium halosepticum*, was described by Wyss<sup>6</sup> in 1904.

## REPORT OF A CASE

W. H., a white boy aged 12 years, was admitted to the hospital Sept. 30, 1937 with draining of the left ear of two weeks' duration and pain in the right hip of three days' duration. The patient had suffered from chills on two occasions, and his temperature had shown a daily elevation to 104 F. for seven days. His temperature on admission was 104 F. The past history revealed no diseases except scarlet fever.

Physical examination revealed that the boy was well developed, semistuporous and acutely ill. General examination showed no disorders except tenderness of the left mastoid region and drainage from the left external ear. The right thigh was held in 100 degrees flexion and 70 degrees abduction. Definite fullness was present about the anterior and posterior aspects of the area of the hip and severe muscular spasm about the hip in all directions. The temperature was 104 to 106 F. The hemoglobin content was 75 per cent, red blood cells numbered 4,300,000 and white blood cells 14,200, with polymorphonuclear leukocytes 80 per cent and lymphocytes 20 per cent. A cutaneous tuberculin test gave negative results. Reaction to the Schick test was positive. Wassermann and Kahn reactions were negative. Treatment with fluids given by rectum, dextrose given intravenously and apple juice and water given by mouth was initiated on admission. A blood culture was taken.

October 2 a lumbar puncture was made. The spinal fluid showed 243 cells, of which polymorphonuclear cells made up 92 per cent. The Pandy test showed globulin 1 plus. The right hip was aspirated anteriorly and a small amount of pus obtained. A posterior incision was made and about ½ ounce (15 cc.) of thin, yellow-green, foul-smelling pus was obtained. A rubber tube drain was sutured to the capsule with a petrolatum pack to the wound. Traction was applied to the right leg (fig. 1). Sixty cc. of blood was given intravenously on October 2 and 150 cc. on October 4. A mastoidectomy was performed on the left side. Much pus was found over the lateral sinus and dura. Smears and cultures were made. On October 4 paralysis of the sixth and seventh cranial nerves on the left side was noted.

October 8 the hemoglobin content was 50 per cent, red blood cells 2,300,000 and white blood cells 18,500. The differential count showed polymorphonuclears 85 per cent and lymphocytes 15 per cent. Examination of the urine gave negative results. Drainage from the left mastoid region and the right hip continued. The temperature was 99.2 to 103.2 F.

October 14 an abscess over the medial posterior aspect of the right thigh was incised and about 15 cc. of thin, greenish, foul-smelling pus obtained. Drainage continued from the left mastoid.

October 17 the right leg was found to have assumed a position of external rotation, and a clinical diagnosis of slipping of the capital epiphysis was made. A double spica cast was applied after internal rotation of the right leg (fig. 2).

The patient's serum on October 13, October 18 and November 6 did not agglutinate *Brucella abortus*, *Brucella melitensis* or *Brucella tularensis*. A blood culture was made October 18 in liver infusion broth and in Rosenov's medium.

Transfusions were given on October 21 and October 26.

November 14 involvement of bone at the upper end of the femur was extensive, with evident sequestration of the neck and trochanteric areas (fig. 3). The patient continued to have a septic temperature, and his general condition remained unchanged. He occasionally complained of pain in the anterior aspect of the right hip. Moderate amounts of pus drained from the wounds. On November 12 the external ear was dry, and on November 30 the mastoid wound was dry and practically closed.

6. Wyss, O.: Ueber einen neuen anaeroben pathogenen Bacillus. Beitrag zur Aetiologie der akuten Osteomyelitis. Mitt. a. d. Grenzgeb. d. Med. u. Chir. 13:199, 1904.

From the Orthopedic Service and Laboratory of Pathology of the Children's Memorial Hospital.

1. Dack, G. M.; Dragstedt, L. R., and McCullough, N. B.: Comparison of *Bacterium necrophorum* from Ulcerative Colitis in Man with Strains Isolated from Animals. J. Infect. Dis. 62:169 (March-April) 1938.

2. Dack, G. M.; Dragstedt, L. R., and Heinz, T. E.: *Bacterium necrophorum* in Chronic Ulcerative Colitis. J. A. M. A. 106:7 (Jan. 4) 1936.

3. Weinberg, M.; Nativelle, R., and Prévot, A. R.: Les microbes anaérobies, Paris, Masson & Cie, 1937.

4. Brunner, W.: Ueber *Bacillus funduliformis*-Infektionen unter besonderer Berücksichtigung der pleuralen Erkrankungsformen. München. med. Wchnschr. 84:2012 (Dec. 17) 1937.

5. Lemerre, A.; Grégoire, R.; Laporte, A., and Couvelaire, R.: Les aspects chirurgicaux des infections à "*Bacillus funduliformis*." Bull. Acad. de méd., Paris 119:352 (March 29) 1938. Chalmot, P.; Leichtmann, P., and Ledoux, A.: Les septicémies à "*Bacillus funduliformis*" d'aspect chirurgical. Paris méd. 2:129 (Aug. 19) 1939.



Through December the patient continued to have a septic temperature, which gradually subsided. The old sinus just below the wound on the right hip began to discharge profusely. An abscess developed in the right inguinal region. On Jan. 31, 1938 the inguinal abscess was aspirated and about 1 cc. of



Fig. 2.—Reduction of slipped femoral epiphysis, October 18.

purulent material obtained. This abscess and the sinus of the hip continued to drain.

March 22, because of increasing formation of sinuses, sequestrectomy of the head, neck and trochanteric areas of the right femur was performed (fig. 4). After the operation the condition of the patient improved steadily. Through April the wound continued to drain moderately. May 17 granulation tissue had formed, and there was slight drainage still present around the area of granulation.

July 7 the patient was walking on a caliper brace. There was no drainage. The patient's recovery continued uneventfully through August, and he was discharged from the hospital Sept. 8, 1938.

June 13, 1939, although protected by a walking caliper brace, the femur subluxated from its position in the acetabulum. A

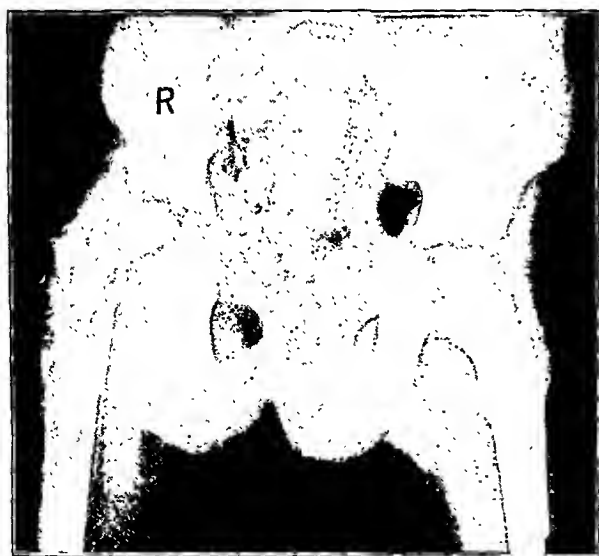


Fig. 3.—Roentgen sequestration of femoral trochanters, neck and head, Jan. 24, 1938.

well-leg traction cast was applied. A massive graft taken from the anterior aspect of the femur was placed to engage in the acetabulum to preserve the length of the leg. This graft survived, giving stability to the hip.

May 8, 1940 the gait was stable, but increasing adduction of the femur was present. Shortening, to the extent of  $1\frac{1}{2}$  inches

(3.8 cm.), had occurred. Osteotomy was proposed. The patient's general health was excellent.

#### BACTERIOLOGY

Smears made from the specimens of pus aspirated from the hip joint and from the perisinal abscess on Oct. 2, 1937 revealed many small pleomorphic gram-negative organisms, varying in size from coccobacilli to bacilli slightly longer than colon bacilli. The predominating form was that of a short slender rod. The organisms stained poorly and showed some bipolar and granular forms. The aerobic cultures remained sterile. In one tube of Rosenow's medium there was a slight growth of slender gram-negative rods over the pieces of brain at the bottom of the tube where anaerobic conditions exist. No other anaerobic cultures were made from the pus. The rods from the Rosenow broth failed to grow in either aerobic or anaerobic subcultures.

Direct smears from the infected ear made at about the same time as the aforementioned smears showed a few gram-negative rods mixed with gram-positive cocci in groups. Aerobic cultures only were made, and the bacilli did not grow.

A portion of the sequestrum from the head of the femur removed on March 22, 1938 was ground with sterile broth, and smears and cultures

were made. In direct smears, a few organisms were found resembling those in smears from the pus. No growth occurred in aerobic cultures. From anaerobic cultures in 0.1 per cent cystine blood agar slants and from Rosenow's medium, gram-negative organisms were isolated which appeared identical in form with those described in literature as *B. funduliformis* and *Bact. necrophorum*. A striking pleomorphism was exhibited by the organisms, particularly on blood agar and cystine blood agar. In one twenty-four hour culture there were forms resembling those described by Dack, Dragstedt and McCullough<sup>1</sup> on ascorbic acid medium. These

forms were irregular staining and filamentous, with bulbous swellings which gave them a bizarre appearance. Usually, however, the form was that of one or more of the three characteristic types described in the literature: small bacilli, filaments and spherical forms (fig. 6). Filamentous forms, sometimes looped about to form tangled masses, were usually predominant in young cultures. The spherical forms, varying in size and in intensity of staining and showing numerous ghost forms were found in older cultures. Neither spores nor branches were formed.

These organisms were strict anaerobes and died in a short time on solid mediums when exposed to the air. In culture in deep brain medium they remained viable after several weeks at room temperature. The organisms were fastidious in their requirements for growth, the addition of such substances as blood, brain tissue or cystine being necessary. In all of the cultures a butyric acid-like odor developed. Colonies on blood agar were small, round, elevated, grayish and about 0.15 to 1 mm. in diameter. As in the cultures described by Dack and his associates,<sup>1</sup> hemolysis of the alpha type appeared around the colonies only after they had been exposed to atmospheric oxygen. After longer exposure the zone would often com-



Fig. 4.—Roentgen appearance June 1, after sequestrectomy.

pletely clear. In Rosenow's medium growth occurred only over the pieces of brain at the bottom of the tube. Gas was produced in this medium. Motility was not observed in twenty-four or forty-eight hour broth cultures.

The biochemical characteristics of the organism were tested in a basic medium of 0.1 per cent cystine veal infusion broth. Indole was produced when dextrose and tryptophan were added



Fig. 5.—Roentgen appearance April 8, 1940, showing graft of bone in place.

to the basic medium. Hydrogen sulfide was formed. Gelatin was not liquefied. Fermentation reactions were tested in a soft agar basic medium to which carbohydrates were added in 1 per cent strength, bromocresol purple being used as an indicator. Acid and gas were produced in dextrose and levulose. Sucrose, lactose, maltose, salicin, inulin and mannite were not fermented after two weeks' incubation. No growth occurred in cystine litmus milk.

A number of blood cultures made in Rosenow's medium remained sterile.

#### ANIMAL INOCULATIONS

Guinea pigs and rabbits were inoculated to test the pathogenicity of this strain for laboratory animals. Two guinea pigs were inoculated intraperitoneally, 1 with 1 cc. of

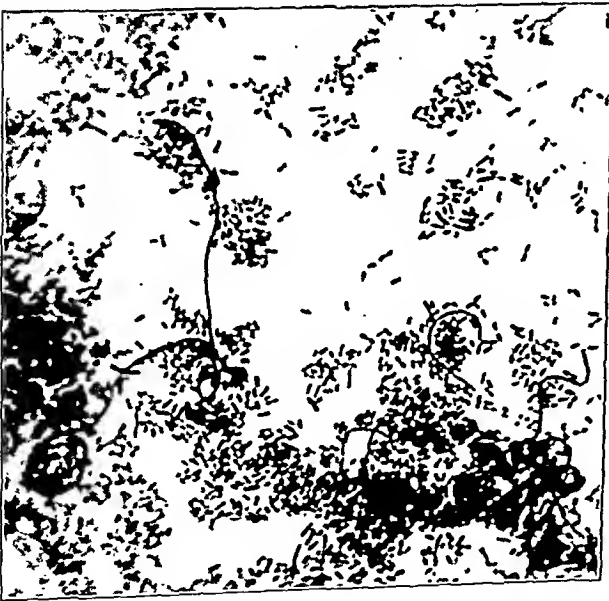


Fig. 6.—Section of stained smear of forty-eight hour culture on cystine blood agar slant, showing bacilli and a few filaments.

the ground emulsion of the bone removed from the patient, the other with 1 cc. of a brain broth culture of the organisms. Both remained healthy. Four rabbits were inoculated with cultures of the organisms. In 1 given an injection sub-

cutaneously a small firm nodule developed six days later at the site of inoculation. Four days later this nodule had disappeared, and the rabbit showed no further evidence of infection. One rabbit inoculated intravenously showed no evidence of infection. In an attempt to produce osteomyelitis, the inoculations were made directly into the shafts of the femurs of 2 rabbits. One of these animals showed no signs of infection. In the other a firm mass about 4 mm. in diameter appeared in the subcutaneous tissue of the wall of the lower part of the abdomen about ten days after inoculation. Five weeks after inoculation the rabbit was weak and emaciated and seemed to have lost the use of the inoculated leg. Cultures of the heart blood were made in the deep brain medium. The rabbit was then killed and an autopsy performed. The subcutaneous abscess was encapsulated. It was filled with thick white stringy material having a foul odor. A similar though smaller abscess was present in the soft tissue near the head of the right femur. The joints showed no inflammation, and no gross changes were visible in the bone. The liver, spleen and kidneys appeared normal. The blood culture remained sterile. Gram-negative rods were found in large numbers in smears of the pus from both abscesses. *Bact. necrophorum* was recovered from both in pure cultures.

The invasive ability of this strain was shown in the production of the lesion about 9 mm. from the original injection in the shaft of the femur. That this lesion was well localized is interesting, in view of the localized lesions produced by this strain in the patient.

After this animal passage, cultures of the organisms were injected in 2 rabbits, in 1 intravenously and in 1 subcutaneously. Death of both occurred within seventy-two hours. This was probably due to the fact that the growth of the organism was much enhanced by animal passage, as the virulence of a strain usually remains unchanged and produces the same type of lesion repeatedly.

#### COMMENT

The ability of *Bact. necrophorum* in pure culture to invade tissue and to become localized is strikingly demonstrated in the case described.<sup>4</sup> Brunner stated that in children the focus for a general infection with this group of anaerobes is almost without exception otitis media with mastoiditis. It seems probable in this case that the middle ear was the primary focus, especially since gram-negative bacilli which did not grow out in aerobic cultures were seen in direct smears.

As has been stated by Dack and his associates,<sup>7</sup> by Brunner<sup>4</sup> and by others, infections due to these bacilli are probably much more common than is ordinarily supposed. Shaw's<sup>8</sup> suggestion that nontuberculous abscess of the psoas muscles may often be due to these anaerobes has been substantiated in a recent case reported by Ortmayer.<sup>9</sup>

The increasing number of infections due to *Bact. necrophorum* reported in the literature and their seriousness or fatal outcome makes their recognition worthy of more consideration.

#### CONCLUSION

In a case of osteomyelitis of the femoral head and neck of obscure causation extensive studies proved the process to be due to *Bact. necrophorum*. Although this is apparently the first case of its kind reported in the literature, it is probable that this disease process would be found more often if similar studies were made.

Suggestions and confirmation of the bacteriologic study were made by Dr. Gail M. Dack.

6 North Michigan Avenue.

7. Dack, G. M.; Dragstedt, L. R., and Heinz, T. E.: Further Studies on *Bacterium Necrophorum* Isolated from Cases of Ulcerative Colitis, *J. Infect. Dis.* 60: 335 (May-June) 1937.  
8. Shaw, F. W.: Human *Necrobacillosis*, *Zentralbl. f. Bakt.* (pt. 1) 129: 132 (July 11) 1933.  
9. Ortmayer, M.: Bilateral Nontuberculous Iliopsoas Abscess, *Surg., Gynec. & Obst.* 66: 778 (April) 1938.



## Clinical Notes, Suggestions and New Instruments

### RAT-BITE FEVER IN AN INFANT BITTEN AT THE AGE OF ELEVEN DAYS

JOSEPH GREENGARD, M.D., AND EDMOND R. HESS, M.D.  
CHICAGO

A careful search of the literature has failed to reveal a case of rat-bite fever in an infant as young as the one observed by us. For this reason it is felt desirable to record this instance of an infant who was bitten by a rat at the age of 11 days and in whom the incubation period and course of the disease could be observed in detail. The youngest child previously reported, an infant aged 3 months, was described by Sanders<sup>1</sup> in 1922. Bayne-Jones<sup>2</sup> collected 75 cases occurring in the United States from 1839 to 1930. Only 9 of the patients were under 2 years of age.

#### REPORT OF CASE

**History.**—C. B., an infant Negress aged 11 days, entered the hospital on April 19, 1940 about two hours after having been bitten by a rat while sleeping in her crib. Physical examination showed nothing abnormal except for the left hand, which appeared swollen and revealed several deep tooth marks on the thenar eminence which were oozing blood. The wound was cleansed with green soap and a dry dressing applied. Antirabies vaccine was administered in doses of 1 cc. daily for twenty-one days.

The wound healed quickly and the hand resumed a perfectly normal appearance until May 1 (twelve days after the bite), when a deep-seated induration was first noted in the left thenar eminence. In the next few days the thumb became swollen, and a small hard red area appeared at its base. On May 4 (fifteen days after the bite) the axillary temperature rose to 101.2 F. The following day it was normal, but on May 6 it rose to 102 F. On May 7 induration and redness of the left thenar eminence and the first phalanx of the index finger at the site of the tooth perforations had increased. Although no lymphangitis was noticed there was a definitely palpable epitrochlear gland about the size of a buckshot and an axillary gland the size of a large pea on the left. Axillary temperature ranging between 101 and 103 F. continued for the next five days. A blotchy, erythematous eruption appeared on the trunk at the onset of the febrile stage and persisted for several days. The general condition of the infant remained excellent. A diagnosis of rat-bite fever was made.

An afebrile period of one week then ensued, but on May 19 the axillary temperature again rose to 100.2 F. and the red blotchy cutaneous eruption reappeared. By this time the local lesion on the thenar eminence and on the index finger had resolved to a considerable degree, but the abnormality in the axillary and epitrochlear glands persisted.

After an afebrile period of four days the temperature rose to 103.4 F., and a purulent nasal discharge was noted. The ear drums were reddened, but the landmarks were distinct. The chest was clear. The rash had disappeared completely. Obviously an intercurrent infection of the upper part of the respiratory tract had occurred. The following day the temperature rose to 104.8 F. Sulfapyridine was initiated by mouth in doses of 1½ grains (0.7 Gm.) a day. Both ear drums were definitely bulging, and a bilateral paracentesis was done, with drainage of thick pus.

The infant continued to have a septic axillary temperature of 101 to 103 F. An ulcerative lesion appeared in the gum occupying the position of the upper right lateral incisor tooth bud. There appeared to be a small fistulous track with a dirty grayish material covering it. The right cheek seemed slightly fuller than the left. A smear taken from the necrotic area was negative for spirochetes, and a roentgenogram of the maxilla was negative.

From the Children's Division of the Cook County Hospital and the Loyola University School of Medicine.

1. Sanders, T. C.: Rat-Bite, J. Oklahoma M. A. 15: 183 (June) 1922.  
2. Bayne-Jones, Stanhope: Rat-Bite Fever in the United States, Internat. Clin. 3: 235 (Sept.) 1931.

In the next few days the fever subsided. On June 2, however, the axillary temperature suddenly rose to 106.6. Respirations became grunting and the abdomen distended. On physical examination dulness was obtained over the entire right portion of the chest, a few coarse rales were heard and the ears were draining pus profusely. June 3 the infant died, one month after the onset of rat-bite fever and two weeks after the onset of the intercurrent infection of the respiratory tract.

**Laboratory Examinations.**—The organism was isolated by inoculation in mice during the first febrile episode. On May 14 several white mice whose blood was found negative for spirochetes by dark field examination were inoculated intraperitoneally with whole blood obtained from the infant. Thirteen days later stained smears of the peripheral blood from one of the inoculated mice were examined and the typical organism of rat-bite fever (*Spirochaeta morsus muris*) was found. Subsequent blood smears from the other mice also revealed the spiral organisms.

Urinalysis consistently showed the urine to be normal except for the admission urine, which showed albumin and an occasional finely granular cast.

The blood showed gradually progressive anemia. The hemoglobin dropped from 15.6 Gm. to 11.0 Gm.; the erythrocyte count fell to 3,680,000; the leukocyte count was 14,700 with 59 per cent neutrophils, 34 per cent lymphocytes and 7 per cent monocytes.

The blood Wassermann and Kahn reactions were persistently negative until two days before death, when the Kahn reaction became positive (3 plus). Blood cultures were consistently negative for spirochetes.

Roentgenograms of the chest and long bones were normal. Mantoux tests with 0.01 mg. and 0.1 mg. old tuberculin gave negative results.

**Autopsy.**—Dr. J. J. Kearns, coroner's pathologist, performed an autopsy which revealed the following abnormalities: The lungs were subcrepitant and studded with pinpoint to split pea-sized hemorrhagic areas. On cut surfaces the upper lobes were pinkish red and granular. The mucosa of the trachea and bronchi was swollen and dusky red. The tracheobronchial lymph nodes were enlarged. The pericardial sac contained about 20 cc. of amber-colored fluid with flecks of fibrin. The myocardium was pale and soft; the endocardium revealed no changes. The intima of the aorta and coronary arteries was discolored lemon yellow.

The peritoneal surfaces were smooth, dry and dull. The liver weighed 195 Gm. and was dark brownish red and firm. The gallbladder was enlarged to 6 by 3 cm.; the wall was pale lemon yellow. The spleen weighed 55 Gm., and its capsule was covered with loosely adherent gray-yellow membrane in places. The splenic pulp was semifirm and dark brownish red, and the markings were indistinct. The kidneys together weighed 40 Gm. and were pale and studded with punctate and ecchymotic hemorrhages. The mucosa of the esophagus, stomach and small bowel was swollen and dark gray. The head was not opened.

Microscopic sections were made of the various tissues, but a thorough search by special staining technic failed to reveal the spirochetes.

The anatomic diagnosis was (1) bilateral hemorrhagic bronchopneumonia, (2) acute serosanguineous tracheobronchitis, (3) serofibrinous pericarditis, (4) cloudy swelling of the myocardium, liver and kidneys, (5) hemorrhagic nephritis, (6) septic hyperplasia of the spleen and (7) hydrops of the gallbladder.

#### COMMENT

Rat-bite fever has a worldwide distribution, and many cases have been recorded in the literature. Transmission of the disease occurs through the bite of an animal, most commonly the rat, though other animal vectors have been responsible, notably the cat, weasel, dog and pig. Opportunity for such infection is not common in early infancy, and a rat bite sustained at the age of 11 days is remarkable. That such an incident can occur in a modern American urban community is of great sociologic significance. Infestation with rats is widespread in Chicago, and at Cook County Hospital a relatively large number of rat bites are observed in young children. The community has made little effort to correct this situation.

The onset of the first bout of fever occurred in the infant under observation exactly fifteen days after the bite. Four days prior to this, twelve days after the bite, the local lesion at the site of the tooth perforations on the hand made its first appearance with the evolution of a deep-seated induration associated with edema of the thumb and index finger and a lymphadenitis involving the epitrochlear and axillary glands. With the onset of the fever a generalized macular erythematous lesion appeared, lasting several days. After an afebrile interval a second bout of fever and erythema occurred, and then, unfortunately, an intercurrent infection of the respiratory tract supervened which terminated in hemorrhagic bronchopneumonia and death.

When the first febrile episode occurred an effort was at once made to isolate the specific etiologic factor by animal inoculation, since direct examination of the infant's blood failed to reveal the spirochete. This procedure was successful, and the organism was demonstrated in stained smears of the peripheral blood of the mice inoculated. The organism is a spiral called *Spirochaeta morsus muris* and was first described by Futaki and his associates.<sup>3</sup> It is a short spiral from 2 to 5 microns long with about four curves. The Wassermann reaction may be positive in cases of rat-bite fever but is not consistently so. A positive Kahn reaction was obtained in this child before death, which was due to an intercurrent sepsis. In uncomplicated cases the prognosis is usually good. Therapy is by the use of arsenicals.

#### SUMMARY AND CONCLUSIONS

1. An infant Negress aged 11 days was bitten by a rat, and rat-bite fever developed.
  2. The incubation period in the infant described was twelve days.
  3. The specific organism was isolated by animal inoculation.
  4. Two typical episodes of fever and erythema occurred with a characteristic local lesion.
  5. Death resulted from an intercurrent infection with hemorrhagic bronchopneumonia.
- 4753 Broadway.

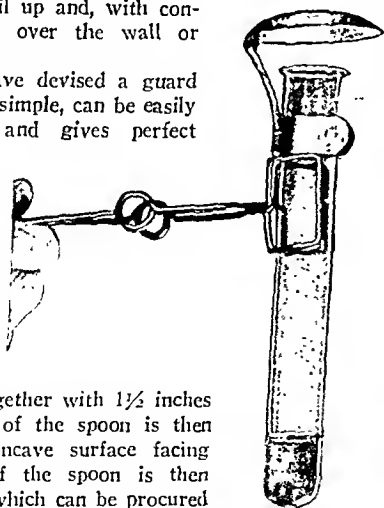
#### A TEST TUBE GUARD

J. ROBERTSON KNOWLES, M.D., Boston  
Surgeon, Boston and Maine Railroad

Any one who has occasion to examine urines, and especially a person who heats Benedict solution over a Bunsen burner or an alcohol lamp, knows how easy it is to have the solution boil up and, with considerable force, go all over the wall or surrounding objects.

For that reason I have devised a guard for a test tube which is simple, can be easily made, is inexpensive and gives perfect protection.

The guard, as may be seen in the accompanying illustration, is made of an ordinary large light teaspoon, by means of a pair of tin clippers. The handle is cut off from the spoon, which leaves the bowl of the spoon together with 1½ inches of the stem. The bowl of the spoon is then bent down, with the concave surface facing downward. The stem of the spoon is then soldered to a tin spring, which can be procured at any tinsmith's shop, and cut and bent to fit the diameter of the test tube. This spring does not allow the guard to slip, and it allows the examiner to snap the guard off and on to the test tube with the greatest of ease.



Test tube guard.

3. Futaki, K.; Takaki, F.; Taniguchi, T., and Osumi, S.: Rat-Bite Fever, *J. Exper. Med.* 23: 249 (Feb.) 1916; *Spirochaeta Morsus Muris*, *ibid.* 25: 33 (Jan.) 1917.

## Special Article

### GLANDULAR PHYSIOLOGY AND THERAPY

#### THE FUNCTION OF THE ADRENAL CORTEX

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*This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—ED.*

When the adrenal glands are removed from laboratory animals, symptoms of deficiency develop, which may be summarized as follows: The first notable change is usually a loss of appetite, which is soon followed by nausea, vomiting, increased peristalsis and eventually bloody diarrhea. Associated with these changes are profound weakness of the muscles and a listless stupor, or, in some animals, restlessness and marked salivation, with clonic movements and general convulsions similar to those observed in hypoglycemia induced by insulin. There is a gradual decrease in body temperature and a decrease in the basal metabolic rate.

Continuance of the state of adrenal deficiency is invariably associated with a decrease in blood pressure to the death level, an increase in the hematocrit reading and a progressive decrease in the volume of the circulating blood. Soon after removal of the adrenal glands there is a marked and continuous increase in the concentrations of nonprotein nitrogen and potassium and a decrease in the concentrations of sodium and chloride in the blood serum.

The concentration of dextrose in the blood and of glycogen in the liver depends on whether the animal ingests food. With a daily intake of food the blood sugar may be within normal limits, but if an adrenalectomized animal does not eat, the blood sugar level drops rapidly and glycogen disappears from the liver.

The administration of an extract from the adrenal cortex promptly reverses the trend of the changes outlined. After a short interval the profound weakness and prostration are relieved, and within a few hours the concentrations of sodium and chloride increase. The potassium and nonprotein nitrogen in the serum decrease more slowly to normal. If the deficiency has been allowed to progress nearly to the point of death, treatment with an extract from the adrenal cortex for several days may be required before the appetite returns to normal and the animal can be considered fully restored.

One of the most interesting and important observations is that of the influence of sodium and potassium salts. The administration of potassium salts rapidly aggravates the condition and may cause the death of the adrenalectomized animal. The administration of a diet high in sodium chloride and sodium citrate or sodium bicarbonate with a low content of potassium has such a beneficial influence that the amount of

extract of adrenal cortex required may be greatly reduced, and eventually the animal may be maintained in a normal condition without the administration of any cortical substance.

Although the concentrations of the constituents of the blood in such an animal may be within normal limits, and although the appetite, weight and body temperature and the general condition may be normal, the animal cannot withstand stress and may rapidly succumb to a high intake of potassium salts, a low environmental temperature, violent exercise or, in particular, a sudden withdrawal of sodium salts from the diet.

After the successful preparation of an extract of adrenal cortex which would maintain the life of adrenalectomized animals, investigators immediately became interested in a study of its mode of action. A wide divergence of opinion soon became evident. The regulation of carbohydrate metabolism as the prepotent action of the adrenal was suggested and vigorously upheld. Changes in blood pressure and in the volume of the blood and the distribution of electrolytes and water seemed of primary importance to another group. A possible relation between the adrenal cortex and mineral metabolism, including renal function and the excretion of sodium and potassium, was investigated by still others.

Early in the investigation Hartman and his associates<sup>1</sup> suggested the name "cortin" for the hormone of the adrenal cortex, and until quite recently all physiologic effects produced by an extract of the adrenal cortex were ascribed to the vital principle of the gland. In 1934 crystalline compounds were separated, and by 1938 several crystalline compounds, shown in the structural formulas, had been isolated, some of which showed marked physiologic activity. These compounds were designated as cortin-like, which indicated physiologic activity of the same quality but quantitatively inferior. The chemical investigation of the gland has now been carried to the point where the active extract can be separated into fractions either as crystalline compounds or as purified amorphous material, and the physiologic investigation of this series of individual compounds has raised an important question. Does the adrenal cortex elaborate one compound which can be regarded as the vital hormone of the gland, or does it prepare a number of hormones, each with a special and specific function? The results presented in this paper answer this question and indicate that no one compound can be regarded as the vital or essential hormone which can produce all the physiologic effects of the gland. Some of the physiologic activities which are influenced by the adrenal cortex are indicated in the following outline:

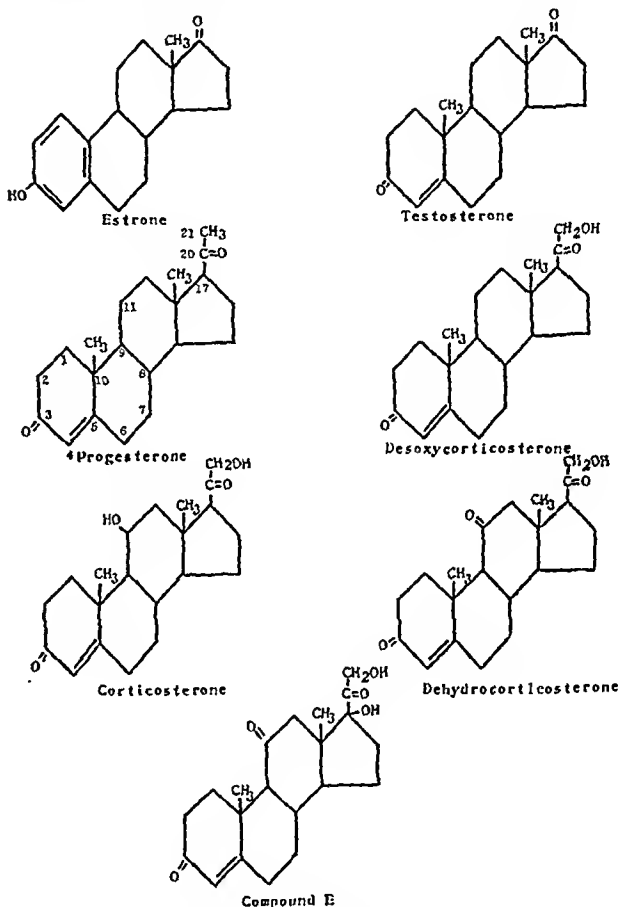
#### PHYSIOLOGIC ACTIVITIES AFFECTED BY THE ADRENAL CORTEX

The physiologic activities affected by the adrenal cortex are carbohydrate metabolism, capacity of muscle to respond to stimulation of (1) long duration and (2) short duration, distribution of electrolytes, renal function, growth of young animals (rats), atrophy of adrenal and thymus glands of normal rats, and resistance to stress.

The physiologic processes associated with the first four items can be considered in relation to the site of action and the compounds or fraction from the adrenal cortex as shown in the accompanying table.

1. Hartman, F. A.; Brownell, K. A.; Hartman, W. E.; Dean, G. A., and MacArthur, C. G.: The Hormone of the Adrenal Cortex. *Am. J. Physiol.* **86**: 353-359 (Sept.) 1928.

Britton and Silvette<sup>2</sup> have made an extensive study of the influence of the adrenal cortex on carbohydrate metabolism and have shown that glycogen in the liver and dextrose in the blood serum may be reduced to low levels after removal of the adrenal cortex. Long and Lukens,<sup>3</sup> Evans<sup>4</sup> and Grollman<sup>5</sup> and others tried to demonstrate an effect on carbohydrate metabolism by extracts of the adrenal cortex through the use of phlorhizin, hypophysectomized-depancreatized animals and partially depaencreatized rats. Rats which were partially depaencreatized when young might have glycosuria after they had increased in weight, since the small amount of pancreas remaining



Structural formulas of adrenal compounds and of chemically related steroids.

could not furnish sufficient insulin for the adult animal. If these rats were adrenalectomized the glycosuria disappeared, and if they were given sodium chloride or sufficient cortical substance to maintain life, glycosuria did not reappear. At the time these experiments were carried out by Long and others, excessive amounts of cortical extract were not administered, since it did not appear necessary to give more than was required to

2. Britton, S. W., and Silvette, H.: The Adrenal Cortex and Carbohydrate Metabolism, in *Cold Spring Harbor Symposia on Quantitative Biology*, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5, pp. 357-359.

3. Long, C. N. H., and Lukens, F. D. W.: The Effects of Adrenalectomy and Hypophysectomy upon Experimental Diabetes in the Cat. *J. Exper. Med.* **63**: 465-490 (April) 1936. Long, C. N. H.: Studies on the "Diabetogenic" Action of the Anterior Pituitary, in *Cold Spring Harbor Symposia on Quantitative Biology*, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5, pp. 344-353.

4. Evans, Gerald: The Adrenal Cortex and Endogenous Carbohydrate Formation. *Am. J. Physiol.* **114**: 297-308 (Jan.) 1936.  
5. Grollman, Arthur: The Relation of the Adrenal Cortex to Carbohydrate Metabolism. *Am. J. Physiol.* **122**: 469-471 (May) 1934.

maintain life. Finally Long, Fry and Thompson<sup>6</sup> showed that pure crystalline compound B, or corticosterone, produced glycosuria in partially depancreatized rats, and that the same results could be produced with large amounts of an extract from the adrenal cortex. No distinction was made by Long and his associates between the effect of the crystalline compound B and that of the whole extract. The evidence indicated that larger amounts of the whole extract were required to produce glycosuria than to maintain life, but this conclusion suggests the question whether the maintenance of life and the effect on carbohydrate metabolism are both due to the action of one vital hormone. This is one interpretation.

Another interpretation is that the adrenal cortex produces a series of compounds, some of which maintain life but have little effect on carbohydrate metabolism; other compounds have a marked effect on carbohydrate metabolism. In the extracts which were first used those compounds essential for maintenance of life were present in adequate amount, but there was a smaller quantity of those which affect carbohydrate metabolism. By the use of large amounts of extract

*Physiologic Processes Associated with Glyconeogenesis, Muscle Activity, Distribution of Electrolytes and Renal Function in Relation to the Site of Action and the Compound or Fraction from the Adrenal Cortex*

Primary Physiologic Activity	Primary Site of Action	Compounds or Fractions from Adrenal Cortex
Glyconeogenesis Muscle efficiency	Liver Muscles	Corticosterone and its derivatives with an atom of oxygen on C <sub>11</sub>
Distribution of electrolytes	Extracellular fluid Intracellular fluid	Desoxycorticosterone
Renal function	Kidney	Amorphous fraction

a sufficient amount of the compounds that affect glyconeogenesis was given to produce glycosuria.

Long, Katzin and Fry<sup>7</sup> clearly demonstrated that the adrenal cortex increases the rate of glyconeogenesis and that the administration of pure crystalline compounds A, B and E resulted in the conversion of protein to carbohydrate. Recently Wells<sup>8</sup> has shown wide divergence in the response of the various fractions of the adrenal cortex in respect to glyconeogenesis. Marked activity is possessed only by those compounds in which an atom of oxygen is attached at C<sub>11</sub>. Desoxycorticosterone is much less efficient, and Wells has now shown that the amorphous fraction has little activity in respect to the conversion of protein to carbohydrate.

In 1936 Ingle<sup>9</sup> published a method for the assay of cortical extracts based on the efficiency of muscles of adrenalectomized rats maintained with the extracts. The method has been used extensively during the past few years, and several compounds have been tested in regard to their effect on the efficiency of muscles stimulated over long periods. The work of Ingle<sup>10</sup> shows

that only compounds which possess an oxygen atom at C<sub>11</sub> have a favorable influence and that desoxycorticosterone and the amorphous fraction, although highly active in other respects, have little effect on the efficiency of muscle.

In the summer of 1938 desoxycorticosterone, furnished by Professor T. Reichstein, was standardized in my laboratory and found to be at least six times more active than corticosterone in the maintenance of a normal level of blood urea and a normal condition in the adrenalectomized dog.<sup>11</sup> The observations of the early experiments have been confirmed and extended:<sup>12</sup> Desoxycorticosterone and its acetate will increase the concentration of sodium and decrease the concentration of potassium in the serum of normal rats more than any other product from the adrenal cortex.

At the same time Loeb and his associates<sup>13</sup> found that the concentration of potassium in the dog can be depressed so low that paralysis can be produced. These striking effects are qualitatively different from those of the amorphous fraction, which is also concerned with the distribution of inorganic ions and water but which does not modify the normal distribution of electrolytes in the blood serum.<sup>12</sup>

During the past several years the compound most active in the maintenance of life after adrenalectomy has been designated as the vital hormone, as the salt and water hormone, as the essential hormone and as cortin. Investigation of the amorphous fraction which is left after removal of the crystalline compounds has indicated that, although on the basis of weight it is many times more efficient than any other product from the adrenal cortex, it nevertheless has little effect on glyconeogenesis and on efficiency of muscle. To designate this fraction as the essential hormone, therefore, is misleading, but for maintenance of renal function, which appears to be its primary effect, it shows an extraordinary degree of activity. Between 1 and 2 micrograms per kilogram of body weight is sufficient for the daily dose of an adrenalectomized dog.

In 1930 Hartman and Thorn<sup>14</sup> showed that the growth of young rats was retarded by adrenalectomy, and they proposed a method for the standardization of extracts from the adrenal cortex on this basis. The method has since been used extensively to measure the activity of adrenal products, particularly by Grollman.<sup>15</sup> It will be considered in more detail later, but here one may state that various fractions separated from the adrenal cortex have been shown to exert widely varying effects on the rate of growth.<sup>12</sup>

When an extract of the adrenal cortex is given to normal rats, the adrenal and thymus glands become atrophied within a week or ten days.<sup>16</sup> Investigations

6. Long, C. N. H.; Fry, E. G., and Thompson, K. W.: The Effect of Adrenalectomy and Adrenal Cortical Hormones upon Pancreatic Diabetes in the Rat, *Am. J. Physiol.* **123**: 130 (July) 1938.

7. Long, C. N. H.; Katzin, B., and Fry, Edith G.: The Adrenal Cortex and Carbohydrate Metabolism, *Endocrinology* **26**: 309-344 (Feb.) 1940.

8. Wells, B. B.: The Influence of Crystalline Compounds Separated from the Adrenal Cortex on Gluconeogenesis, *Proc. Staff Meet., Mayo Clin.* **15**: 294-297 (May 8) 1940.

9. Ingle, D. J.: Work Capacity of the Adrenalectomized Rat Treated with Cortin, *Am. J. Physiol.* **116**: 622-625 (Aug.) 1936.

10. Ingle, D. J.: Personal communication to the author.

11. Reichstein, T., and von Euw, J.: Ueber Bestandteile der Nebennierenrinde. Isolierung der Substanzen Q (Corticosterone) und R sowie weiterer Stoffe, *Helvet. chim. acta* **21**

12. Wells, B. B., and Kendall, E. C.: A C Effect of Compounds Separated from the Adrenal Cortex on the Distribution of Electrolytes and on Atrophy of the Adrenal and Thymus Glands of Rats, *Proc. Staff Meet., Mayo Clin.* **15**: 133-139 (Feb. 28) 1940.

13. Kuhlman, Daniel; Ragan, Charles; Ferrebee, J. W.; Atchley, D. W., and Loeb, R. F.: Toxic Effects of Desoxycorticosterone Esters in Dogs, *Science* **90**: 496-497 (Nov. 24) 1939.

14. Hartman, F. A., and Thorn, G. W.: A Biological Method for the Assay of Cortin, *Proc. Soc. Exper. Biol. & Med.* **28**: 94-95 (Nov.) 1939.

15. Grollman, Arthur: The Comparative Activity of Desoxycorticosterone and Other Crystalline Derivatives and of Purified Extracts of the Adrenal Cortex, *J. Pharmacol. & Exper. Therap.* **67**: 257-264 (Nov.) 1939.

16. Ingle, D. J.: Atrophy of the Thymus in Normal and Hypophysectomized Rats Following Administration of Cortin, *Proc. Soc. Exper. Biol. & Med.* **38**: 443-444 (May) 1938. Ingle, D. J.; Higgins, G. M., and Kendall, E. C.: Atrophy of the Adrenal Cortex in the Rat Produced by the Administration of Large Amounts of Cortin, *Anat. Rec.* **71**: 363-372 (July 25) 1938.

of this response by administration of the various fractions from the adrenal have shown that the effect is highly specific.

Atrophy of the adrenal is produced by corticosterone and those compounds with an oxygen atom at  $C_{11}$ , but the same amount of desoxycorticosterone given over the same interval does not produce atrophy of this gland; the thymus may be slightly hypertrophied.<sup>12</sup> Little if any effect is produced by the administration of enormous amounts of the amorphous fraction free from corticosterone and related compounds. The differences in the physiologic response to the various fractions from the adrenal cortex are perhaps most marked in the effects on growth and on atrophy of the adrenal and thymus glands. It is obvious that these results could be obtained only after separation of the extract into the various constituents, since each fraction produces such highly specific qualitative effects.

#### RESISTANCE TO STRESS

The influence of the various compounds of the adrenal cortex on resistance to stress as given in the preceding outline has been investigated only in part. Little is known in regard to the specific action of the various compounds on bacterial toxins or on histamine. A recent article by Perla and his associates<sup>17</sup> indicates the favorable influence of a combination of sodium chloride and desoxycorticosterone in protection against histamine. Sodium chloride alone was more effective than desoxycorticosterone alone, but the best result was produced by the simultaneous administration of sodium chloride and desoxycorticosterone.

Some preliminary experiments indicate that the compounds with an oxygen atom attached at  $C_{11}$  have a favorable action against the toxic effects of thyroxine in adrenalectomized rats. This work will be continued in order to demonstrate the effect of other fractions in regard to resistance to thyroxine.

Jensen and Grattan<sup>18</sup> have recently shown that corticosterone acetate will prevent convulsions after the injection of insulin. They also tried the whole extract, but since corticosterone acetate produced a favorable effect, it seems probable that corticosterone and related compounds in the whole extract are responsible for the increased resistance to insulin.

The striking response of adrenalectomized rats to phlorhizin when treated with various compounds and fractions of the adrenal cortex has been presented by Wells.<sup>8</sup> It is highly significant that in this experimental condition, which is a sensitive index for glyconeogenesis, those compounds with an oxygen atom on  $C_{11}$  will permit the animal to live with a markedly increased rate of glyconeogenesis. Desoxycorticosterone and the amorphous fraction are not sufficient for maintenance of life under these conditions. A high percentage of adrenalectomized rats given desoxycorticosterone and phlorhizin died in convulsions.

Evans<sup>19</sup> has shown that when the percentage of oxygen in the inspired air was reduced glycogen was deposited in the livers of normal rats but not in the livers of adrenalectomized rats. Since compounds with

an oxygen atom attached to  $C_{11}$  are involved in glyconeogenesis, it seems probable that these are the compounds responsible for the effects noted by Evans.

Selye and Schenker<sup>20</sup> have recently standardized the conditions first suggested by Hartman and his associates<sup>21</sup> with regard to the influence of low temperature on adrenalectomized rats. Since it seemed of interest to investigate this test by the use of purified crystalline compounds and the amorphous fraction, adrenalectomized rats were subjected to low temperature, and it was found that as little as 16 micrograms of corticosterone, about 20 micrograms of compound E and about 13 micrograms of the amorphous fraction were sufficient to maintain life.<sup>22</sup> This indicates that compounds with an oxygen atom on  $C_{11}$  and those found in the amorphous fraction were about equally active.

No experimental work has been carried out to determine the specificity of the various fractions with regard to the resistance of adrenalectomized rats to the injection of water.

#### STANDARDIZATION OF EXTRACTS OF THE ADRENAL CORTEX

The separation of the extract from the adrenal cortex into crystalline compounds and the amorphous fraction permits the identification of the compound responsible for the physiologic activity which has been the basis of each of the several methods that have been used for standardization. Among the many methods which have been proposed, six will be considered.

1. *Survival of Adrenalectomized Rats.*—This criterion is not specific for any compound or group of compounds. Even progesterone has been shown to increase the survival time of adrenalectomized ferrets,<sup>23</sup> and all of the compounds which possess any physiologic activity will permit the survival of adrenalectomized rats. The test does show the presence of some compound which can replace, at least in part, the secretion of the gland, but it is quite nonspecific for the identification of any particular compound.

2. *Growth of Young Rats.*—When the various fractions are administered to adrenalectomized young rats, those compounds with an oxygen atom on  $C_{11}$  retard or actually suppress the growth of the animals whereas the amorphous fraction will bring about an almost normal rate of growth, and desoxycorticosterone acetate may cause a gain in weight greater than that in a normal control.<sup>24</sup> Such a response is not a satisfactory criterion for the identification of any compound or group of compounds. With each solution tested, the rate of growth would be determined by the algebraic sum of the retarding influence of some of the compounds and the beneficial effects of others.

3. *Stimulation of Muscle.*—The Everse and de Fremery test<sup>25</sup> is based on the response of muscle to a short stimulation. The normal animal will react

20. Selye, Hans, and Schenker, Victor: A Rapid and Sensitive Method for Bioassay of the Adrenal Cortical Hormone, *Proc. Soc. Exper. Biol. & Med.* **39**: 518-522 (Dec.) 1938.

21. Hartman, F. A.; Brownell, Katherine A., and Crosby, A. A.: The Relation of Cortin to the Maintenance of Body Temperature, *Am. J. Physiol.* **98**: 674-686 (Nov.) 1931.

22. Kendall, E. C.: The Function of the Adrenal Cortex, *Proc. Staff Meet., Mayo Clin.* **15**: 297-304 (May 8) 1940.

23. Gaunt, Robert, and Hays, H. W.: The Life-Maintaining Effect of Crystalline Progesterone in Adrenalectomized Ferrets, *Science* **88**: 576-577 (Dec. 16) 1938.

24. Wells, B. B., and Kendall, E. C.: The Influence of Corticosterone and  $C_{11}$ -Hydroxydehydrocorticosterone (Compound E) on Somatic Growth, *Proc. Staff Meet., Mayo Clin.* **15**: 324-328 (May 22) 1940. Wells and Kendall.<sup>12</sup>

25. Everse, J. W. R., and de Fremery, P.: On a Method of Measuring Fatigue in Rats and Its Application for Testing the Suprarenal Cortical Hormone, *Acta brev. Neerland.* **11**: 152-153, 1932.

17. Perla, David; Friedman, D. G.; Sandberg, Marta, and Greenberg, S. C.: Prevention of Histamine and Surgical Shock by Cortical Hormone (Desoxycorticosterone Acetate and Cortin) and Saline, *Proc. Soc. Exper. Biol. & Med.* **43**: 397-404 (Feb.) 1940.

18. Jensen, H., and Grattan, J. F.: The Identity of the Glycotropic (Anti-Insulin) Substance of the Anterior Pituitary Gland, *Am. J. Physiol.* **128**: 270-276 (Jan.) 1940.

19. Evans, Gerald: The Effect of Low Atmospheric Pressure on the Glycogen Content of the Rat, *Am. J. Physiol.* **110**: 273-277 (Dec.) 1934.



characteristically both as to the duration of time and as to the vigor of the response to the stimulation. Adrenalectomized rats either will not respond at all or will respond in a much more limited way before the muscle is exhausted. It has been found that desoxycorticosterone acetate produces an effect about ten times greater than that of corticosterone.<sup>11</sup> Compound E has been shown to have little activity.<sup>26</sup> This criterion, therefore, has but little application, and a negative result does not mean lack of cortical activity, for activity may be indicated by other criteria.

4. *Prolonged Stimulation of Muscle*.—This test, which has been developed by Ingle<sup>27</sup> and is not related to the short stimulation of muscle, is highly specific for those compounds which have an oxygen atom attached to C<sub>11</sub>. Compound E apparently is the most active; desoxycorticosterone manifests little activity, and the amorphous fraction in amounts many times that required for maintenance of a normal condition in an adrenalectomized dog is without effect. The high specificity of the compounds which have an oxygen atom attached to C<sub>11</sub> suggests that this test may be used for the quantitative determination of this group of compounds.

5. *Resistance to Low Temperature*.—This criterion is nonspecific, since corticosterone, compound E and the amorphous fraction have all been shown to be about equally active.

6. *Maintenance of Adrenalectomized Animals*.—This method of standardization<sup>28</sup> is not the same as number 1, since survival is not the basis of the test. That amount of material is determined which is required to hold the constituents of the blood within a normal range and to maintain the appetite, weight and normal appearance of the animal. The test becomes highly specific for the amorphous fraction, since this substance will maintain an adrenalectomized dog in excellent condition when as little as 1 to 2 microns per kilogram of body weight is used. Desoxycorticosterone is very active when tested with this method; about 15 micrograms per kilogram of body weight is required to maintain the adrenalectomized dog in normal condition.

#### FUNCTION OF THE ADRENAL CORTEX

The quantitative investigation of the physiologic response to several compounds separated from the adrenal cortex clearly shows that no one compound can produce all of the known effects of the extract. For glyconeogenesis and maintenance of the efficiency of muscle, corticosterone, compound E and their derivatives with an oxygen atom on C<sub>11</sub> are necessary. For the most marked effect on the distribution of electrolytes, desoxycorticosterone is required and for maintenance of normal renal function the amorphous fraction is the most efficient.

These three typical physiologic responses can all be produced, at least in part, by the single substance compound E. For this, however, 10 mg. is required in order to maintain normal renal function in the adrenalectomized dog.

If the structure of compound E is altered by the substitution of an atom of hydrogen instead of a hydroxyl

group on C<sub>17</sub>, the compound is dehydrocorticosterone. Only 2.5 mg. of this is required to maintain normal renal function, and it is about as active as compound E in its effect on glyconeogenesis and on the efficiency of muscle. It does not modify the normal concentration of electrolytes in the serum.

If the structure of dehydrocorticosterone is modified by substitution of two atoms of hydrogen instead of an atom of oxygen at C<sub>11</sub>, the compound is desoxycorticosterone. Three-tenths mg. of this compound will maintain normal function of the kidney, but the effect on glyconeogenesis is very small, and the compound has little effect on the efficiency of muscle. Comparison of these three compounds shows how intimately the physiologic effects are related to the chemical structure.

The close connection between the many physiologic effects as well as the interrelation between carbohydrate metabolism and the distribution of water and inorganic ions is well shown by nonspecific therapy, such as that with dextrose and a diet which contains a low concentration of potassium and a high concentration of sodium chloride and of sodium bicarbonate or sodium citrate. With this nonspecific therapy and without any product of the adrenal cortex it is possible to maintain adrenalectomized dogs in normal condition so far as the concentration of electrolytes in the serum is concerned.<sup>29</sup> Glycogen in the liver and dextrose in the blood are held within normal limits by the carbohydrate in the food. Such animals are to all appearances normal, but they do not possess ability to withstand stress. If the administration of sodium chloride is stopped even for a short time, they rapidly pass into a condition of crisis from adrenal deficiency.

Finally, it is possible to maintain dogs for at least seven days without food, provided sodium chloride is given in the drinking water and potassium salts are withheld. This result can be interpreted only by the primary importance of the regulation of the distribution and excretion of inorganic ions. If the changes in mineral metabolism, which have been well established, were secondary to disturbances in carbohydrate metabolism, it would be possible to maintain a normal condition by the administration of large amounts of dextrose, whether or not sodium chloride was supplied. It has been shown repeatedly by many investigators that this is not possible. On the other hand, when the loss of sodium and the retention of potassium in the adrenalectomized animal are corrected by the administration of large amounts of sodium chloride, glyconeogenesis can proceed at a rate sufficient to maintain the metabolism of carbohydrate within normal limits.

#### CONCLUSION

It has been shown that the adrenal cortex does not elaborate any single substance which can be described as the vital hormone of this gland. An extract of the adrenal cortex contains a surprisingly large number of closely related steroid derivatives which have specific effects, qualitatively different one from the other. Substitution therapy in adrenalectomized animals is inadequate unless the compounds which influence glyconeogenesis and the efficiency of muscles are given together with the compounds that influence renal function and the distribution of water and electrolytes.

26. Reichstein, T.: Ueber Bestandteil der Nebennierenrinde: VI. Trennungsmethoden, sowie Isolierung der Substanzen F. a. H und J, *Helvet. chim. acta* 19: 1107-1126, 1936.

27. Ingle, D. J.: Work Performance of Adrenalectomized Rats Treated with Corticosterone and Chemically Related Compounds, *Endocrinology* 26: 472-477 (March) 1940. Ingle.<sup>9</sup>

28. Pfaffner, J. J.: Swingle, W. W., and Vars, H. M.: The Cortical Hormone Requirement of the Adrenalectomized Dog, with Special Reference to a Method of Assay, *J. Biol. Chem.* 104: 701-716 (March) 1934.

29. Kendall, E. C.: A Chemical and Physiological Investigation of the Suprarenal Cortex, in *Cold Spring Harbor Symposia on Quantitative Biology*, Cold Spring Harbor, L. I., New York, The Biological Laboratory, 1937, vol. 5, pp. 299-310.

## Council on Pharmacy and Chemistry

### PRELIMINARY REPORT OF THE COUNCIL SULFADIAZINE

THE COUNCIL HAS GIVEN CONSIDERATION TO FURTHER SULFONAMIDE DERIVATIVES; IN PARTICULAR, THE 2-SULFANILAMIDOPYRIMIDINE HOMOLOGUE OF SULFANILAMIDE, FOR WHICH IT HAS RECOGNIZED THE NON-PROPRIETARY NAME SULFADIAZINE. IN THIS CONNECTION THE COUNCIL HAS CONSIDERED A PRELIMINARY REPORT ON SULFADIAZINE PREPARED BY DR. PERRIN H. LONG. THE COUNCIL ADOPTED THIS REPORT FOR PUBLICATION AND EXPRESSES ITS GRATITUDE TO DR. LONG FOR THE PREPARATION OF THE FOLLOWING STATEMENT.

OFFICE OF THE COUNCIL.

#### SULFADIAZINE

THE 2-SULFANILAMIDOPYRIMIDINE ANALOGUE  
OF SULFANILAMIDE

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Recently, Roblin and his associates<sup>1</sup> have described the preparation of certain heterocyclic sulfonamide compounds. Among them were 2-sulfanilamido-pyrimidine, 2-N<sup>4</sup>-acetylsulfanilamidopyrimidine, 2-sulfanilamido-4-methylpyrimidine, 2-N<sup>4</sup>-acetylsulfanilamido-4-methylpyrimidine and 4-sulfanilamidopyrimidine. One of these compounds, 2-sulfanilamidopyrimidine, to which the name of sulfadiazine has been given in order to prevent confusing this pyrimidine derivative with the pyridine homologue of sulfanilamide, has been distributed for experimental use and clinical investigation. The name sulfadiazine has been accepted by the Council on Pharmacy and Chemistry.

Feinstone and his collaborators<sup>2</sup> have made an excellent and complete report on the toxicity, absorption and chemotherapeutic activity of this compound in experimental animals. As regards the acute toxicity of sulfadiazine for mice, based on blood concentrations, they found that the L. D. 50 (i. e., the blood concentration of the drug which kills 50 per cent of the mice) lay between 175 and 200 mg. per hundred cubic centimeters. In chronic toxicity studies on monkeys, in which comparisons were again made on the basis of blood concentrations, they observed that sulfadiazine produced less tissue damage than did sulfathiazole or sulfapyridine. An interesting point which was brought out in this study was that the blood concentrations resulting from given doses of sulfadiazine in monkeys and in mice were about four times as high as those resulting from comparable doses of sulfapyridine or sulfathiazole and that the drug existed in the blood primarily in the "free" form because the acetyl derivative appeared to be readily excreted in the urine. They found that this compound had a high degree of therapeutic activity in experimental pneumococcic, hemolytic streptococcus and staphylococcic infections in mice and that it was very effective in the treatment of experimental Friedländer's bacillus infections in mice.

We have been able to confirm the observations of Feinstone and his associates in respect to the toxicity and absorption of sulfadiazine in mice. We have also tested the therapeutic effect of these compounds on

experimental hemolytic streptococcus, pneumococcic, staphylococcic, *Clostridium welchii*, *Cl. septicum* and *Cl. oedematiens* infections in mice. Our experiments lead us to believe that sulfadiazine is a somewhat less effective therapeutic agent than sulfanilamide in experimental streptococcic infections in mice, this observation being based on comparable tests in which the blood concentrations of the two drugs were set at approximately the same levels in the experimental animals.

In type I pneumococcus infections in mice, sulfadiazine proved to be slightly less effective than sulfathiazole or sulfapyridine when tested under comparable conditions. In experimental staphylococcic infections in mice, sulfadiazine was equal, if not slightly superior, to sulfathiazole as a therapeutic agent. In infections in mice produced by the intramuscular injection of *Cl. welchii* or *Cl. septicum*, sulfadiazine was an effective chemotherapeutic agent whether administered by oral or local routes. In these particular experiments sulfadiazine showed good chemotherapeutic activity, with sulfathiazole coming next and sulfapyridine as a fair third, while sulfanilamide exhibited practically no activity. In *Cl. oedematiens* infections in mice, we were unable to demonstrate a significant therapeutic effect with any of the four compounds. Klinefelter,<sup>3</sup> working in our laboratories, has shown that sulfadiazine is a more effective chemotherapeutic agent in experimental *Escherichia coli* infections in mice than is sulfathiazole.

Plummer and Ensworth<sup>4</sup> have reported that sulfadiazine is rapidly absorbed into the blood, that the proportion of acetyl sulfadiazine in the blood is small, that the concentration of the drug in the blood falls rather slowly after the drug has been discontinued, and that most of the ingested sulfadiazine is excreted in the urine. They noted one toxic reaction (a morbilliform rash) in twelve patients treated with the drug.

My associates and I have carried out studies on the absorption, distribution and excretion of sulfadiazine in man. Our studies (contrary to those of Plummer and Ensworth) indicate that the drug is somewhat less rapidly absorbed from the gastrointestinal tract than are sulfanilamide, sulfapyridine and sulfathiazole. In the blood the ratio of the "free" and conjugated fractions of the drug is frequently less than that which has been previously noted for sulfanilamide. Sulfadiazine appears to be excreted somewhat less rapidly than is sulfanilamide or sulfapyridine when renal function is normal. In the urine about a third of the drug exists in the acetylated or conjugated form. The relatively small amounts of acetylsulfadiazine found in the blood are due to the fact that this compound is quite easily excreted in the urine when kidney function is normal.

While our experience has been limited to date, it seems that sulfadiazine passes over into the spinal fluid in concentrations of from two thirds to four fifths of those which exist in the blood. An interesting feature of this drug is the relative ease with which it is possible to maintain adequate concentrations of it in the blood of human patients, and, as a matter of fact, care must be taken to follow the blood levels of sulfadiazine in order to prevent unnecessarily high concentrations of the drug.

It is too early to make a statement regarding the relative clinical therapeutic merits of sulfadiazine, sulfanilamide, sulfapyridine and sulfathiazole. However, our experience to date leads us to believe that sulfadiazine

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1. Roblin, R. O., Jr.; Williams, J. H.; Winnek, P. S., and English, J. P.: Some Sulfanilamido Heterocycles, *J. Am. Chem. Soc.* 62: 2002 (Aug.) 1940.

2. Feinstone, W. H.; Williams, R. D.; Wolff, R. T.; Huntington, Evelyn, and Crossley, M. L.: The Toxicity, Absorption and Chemotherapeutic Activity of 2-Sulfanilamidopyrimidine (Sulfadiazine), *Bull. Johns Hopkins Hosp.* 67: 427 (Dec.) 1940.

3. Klinefelter, H. F.: Personal communication to the author.

4. Plummer, Norman, and Ensworth, H. K.: Absorption and Excretion of Sulfadiazine, *Proc. Soc. Exper. Biol. & Med.* 45: 734 (Dec.) 1940.



is slightly less effective than sulfapyridine or sulfathiazole in the treatment of pneumococcal pneumonia in human beings and that it is of definite value in the treatment of hemolytic streptococcus and staphylococcal infections in man. We have noted in the course of clinical experiments with sulfadiazine that there is very little nausea and vomiting produced by this drug. Drug fever and drug rash have been rare. We have noted 2 instances of leukopenia in 125 patients who have been treated with the drug. Scleral and conjunctival injections have been observed in 2 patients. Sulfadiazine does not cause a fall in the carbon dioxide combining power of the plasma. We have not observed any evidence of renal injury up to the present time. In 1 patient, ill with pneumonia, who on admission to the hospital was found to be suffering from a rather severe acute renal complication incident to his pneumonia, the administration of full doses of sulfadiazine resulted in a blood concentration of 25 mg. per hundred cubic centimeters of the "free" drug within seventy-two hours. Although this patient's renal function was practically zero as measured by the phenolsulfonphthalein test, both the "free" and the acetylated forms of the drug were gradually excreted over a period of days without any evidence of an increase in kidney damage. During the period of the excretion of the drug the patient's renal function was very poor, as was evidenced by the observation that at the time when the drug had been eliminated from the blood the phenolsulfonphthalein test showed a 15 per cent excretion of the dye in two hours. It is to be expected that sulfadiazine will produce certain of the toxic reactions previously described as occurring in the course of treatment with sulfanilamide and other of its derivatives. Our experience up to the present time leads us to believe that sulfadiazine produces fewer toxic manifestations than either sulfanilamide, sulfapyridine or sulfathiazole.

As yet there is insufficient information at hand on which to establish adequate standards of dosage with sulfadiazine. For adult patients ill with pneumonia, it has been our custom to prescribe an initial dose of 4 Gm. of sulfadiazine, to be followed at four hour intervals with 1 Gm. for six doses. The dosage schedule is then changed to 1 Gm. every six hours and is so continued until the patient's temperature has been normal for seventy-two hours. In the majority of patients these doses will produce concentrations of from 6 to 9 mg. per hundred cubic centimeters of the drug in the blood within the first twenty-four hours of its administration. Then as therapy is continued with the lesser amount of sulfadiazine the concentrations of the drug in the blood will tend to fall to between 4 and 7 mg. per hundred cubic centimeters. We have also noted in patients ill with chronic hemolytic streptococcus or staphylococcal infections, such as osteomyelitis, that the administration of 0.05 Gm. per kilogram of body weight of sulfadiazine as the total daily dose will produce concentrations of around 5 mg. per hundred cubic centimeters in the blood. In such patients it is advisable to divide the total daily dose into four parts and to administer them at six hour intervals.

The evaluation of this new chemotherapeutic agent will necessitate extensive experimental and clinical investigation in order to determine its true value. Until the time when such data are available, it is to be hoped that preliminary enthusiasms will not outrun the common sense which we have gained as a result of our experiences with sulfanilamide and its other derivatives during the past five years.

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING STATEMENT.  
OFFICE OF THE COUNCIL.

The Council on Pharmacy and Chemistry of the American Medical Association records with deep sorrow the death, March 1, 1941, of

### Charles Wallis Edmunds

On the afternoon of Saturday, March 1, 1941, death came suddenly to Charles Wallis Edmunds, professor of pharmacology at the Medical School of the University of Michigan.

Dr. Edmunds was born in Bridport, Dorset, England, on Feb. 22, 1873 and came to the United States ten years later. He graduated from the Medical School of the University of Michigan in 1901 and shortly after he began his work in pharmacology as an assistant to Dr. Arthur R. Cushny. Dr. Edmunds was made professor of pharmacology in 1907, as successor to Dr. Cushny, and continued in that position until his death. From 1911 to 1921 he was secretary and from 1918 to 1921 assistant dean of the faculty in the medical school. From 1935 to 1939 Dr. Edmunds was a member of the executive committee of the medical school, and since 1937 he had served as a member of the executive board of the graduate school.

Dr. Edmunds always had a great interest in the United States Pharmacopeia, and he had served on the Revision Committee since 1910. From 1920 he had been a member of the executive committee, a vice chairman since 1930, chairman of the antianemia products advisory board since 1935, and chairman of the committee on biologic assays since 1920. At the 1940 United States Pharmacopeial Convention Dr. Edmunds was chosen president.

He was appointed to the Council on Pharmacy and Chemistry in February 1921 and had been reappointed at regular five year intervals since that time. One of his chief services was the chairmanship of the Committee on Therapeutic Research, which had been in his hands since 1935. For some years he was the referee for endocrine preparations and was instrumental in framing the Council's pronouncements as this field of therapy began its subsequent extensive development. For many years he had been the referee for ergot preparations, and the New and Nonofficial Remedies' chapter on ergot preparations took its definitive form under his refereeship. For approximately fifteen years he was referee for vasoconstrictors. He was always prompt and efficient in his attention to Council duties and brought to the deliberations of the Council the wisdom and judgment of an enlightened and well seasoned intelligence.

For over ten years Dr. Edmunds had been a member of the Committee on Drug Addiction of the National Research Council and at the time of his death was a member of the executive committee of the Division of Medical Sciences of the National Research Council. His wide knowledge in the field of drug assays resulted in his having been made a member of the international committee on drug standardization of the health committee of the League of Nations in 1925. In 1929-1930 he was chairman of the Section on Pharmacology and Therapeutics of the American Medical Association. He was a past president of the American Society for Pharmacology and Experimental Therapeutics and a member of the American Physiological Society, the Association of American Physicians and the Society for Experimental Biology and Medicine. In the field of pharmacology he was a sound contributor toward the advancement of knowledge. With Dr. Arthur R. Cushny he wrote the "Laboratory Guide in Pharmacology," and with Prof. J. A. Gunn of Oxford, England, he recently revised Cushny's textbook on "Pharmacology and Therapeutics." For thirty years, he served on the editorial board of the *Journal of Pharmacology and Experimental Therapeutics*.

However, it will not be wholly through his scientific work that his students, colleagues and friends will remember him. The following tribute was written by a member of the Council who in earlier years was one of Dr. Edmunds' students:

Dr. Edmunds was a genial, understanding teacher and friend, who could be depended on under all conditions. Those of us who were his students remember our first fears when entering

our pharmacology laboratory period, but the kindness and interest of Dr. Edmunds not only in our laboratory problems but also in respect to all the difficulties which beset the medical student soon set these fears at rest. We shall always remember his well known lecture on the pharmacology and therapeutics of gold, especially the climax of the lecture, in which Dr. Edmunds would state so amusingly that nothing was more effective for soothing the itching palm. His colleagues on the Council on Pharmacy and Chemistry will miss his kindly penetrating criticisms, his shrewd analysis of various claims for therapeutic merit and his ability to bring about harmony and compromise in difficult situations. Those of us who worked with him and knew him personally have lost a true friend.

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

OFFICE OF THE COUNCIL.

**BISMUTH SUBSALICYLATE** (See New and Non-official Remedies 1940, p. 150):

The following products have been accepted:

The Lakeside Laboratories, Inc., Milwaukee.

*Ampules Bismuth Subsalsicylate in Oil with Chlorobutanol, 1 cc.*: Each cubic centimeter contains bismuth subsalsicylate 0.13 Gm. (2 grains) suspended in a neutral vegetable oil with 3 per cent chlorobutanol.

*Vials Bismuth Subsalsicylate in Oil with Chlorobutanol, 30 cc.*: Each cubic centimeter contains bismuth subsalsicylate 0.13 Gm. (2 grains) suspended in a neutral vegetable oil with 3 per cent chlorobutanol.

*Vials Bismuth Subsalsicylate in Oil with Chlorobutanol, 60 cc.*: Each cubic centimeter contains bismuth subsalsicylate 0.13 Gm. (2 grains) suspended in a neutral vegetable oil with 3 per cent chlorobutanol.

**NEO-IOPAX** (See New and Nonofficial Remedies, 1940, p. 304).

The following dosage form has been accepted:

Manufactured by Schering Corp., Bloomfield, N. J. U. S. patent applied for. U. S. trademark 297,925.

*Solution Neo-Iopax, 30 cc. Vials*: Each vial contains neo-iopax, 15 Gm. dissolved in sufficient sterile distilled water to make 30 cc.

**SULFAPYRIDINE** (See New and Nonofficial Remedies, 1940, p. 494).

The following dosage form has been accepted:

*Tablets Sulfapyridine-Merrell, 0.5 Gm. (7.7 grains).*

Prepared by the Wm. S. Merrell Co., Cincinnati.

**THEOBROMINE SODIUM ACETATE** (See New and Nonofficial Remedies, 1940, p. 554).

The following dosage form has been accepted:

*Tablets Theobromine with Sodium Acetate, 7½ grains.*

Prepared by The Smith-Dorsey Co., Inc., Lincoln, Neb.

**BACTERIAL VACCINE MADE FROM THE TYPHOID BACILLUS AND THE PARATYPHOID "A" AND "B" BACILLI** (See New and Nonofficial Remedies, 1940, p. 463).

The Upjohn Company, Kalamazoo, Mich.

*Typhoid Paratyphoid Mixed Vaccine* (See New and Nonofficial Remedies, 1940, p. 466): Also marketed in packages of six 2½ cc. vials containing in each cubic centimeter 1,000 million killed typhoid bacilli, 750 million each of killed paratyphoid A and paratyphoid B bacilli.

**METHENAMINE** (See New and Nonofficial Remedies, 1940, p. 266).

METHENAMINE-MERRELL.—A brand of methenamine-U. S. P.

Manufactured by the Wm. S. Merrell Company, Cincinnati. No U. S. patent or trademark.

*Methenamine Tablets-Merrell, 5 grains.*

*Methenamine Tablets-Merrell, 7½ grains.*

**SULFATHIAZOLE** (See THE JOURNAL, Jan. 25, 1941, p. 308).

Sulfathiazole-Abbott.—A brand of sulfathiazole-N. N. R.

Manufactured by Abbott Laboratories, North Chicago, Ill. No U. S. patent or trademark.

*Tablets Sulfathiazole-Abbott, 0.5 Gm. (7.7 grains).*

*Tablets Sulfathiazole-Abbott, 0.25 Gm. (3.85 grains).*

**PENTOBARBITAL-SODIUM** (See New and Nonofficial Remedies, 1940, p. 128).

The following dosage form has been accepted:

*Pentobarbital-Sodium Tablets, 1½ grains.*

Prepared by the Wm. S. Merrell Co., Cincinnati.

**THEEOL-P. D. & CO.** (See New and Nonofficial Remedies, 1940, p. 371).

The following dosage form has been accepted:

*Kapsels Theeol, 0.24 mg.*: Each kapsel (sealed gelatin capsule) contains 0.24 mg. theeol.

## Council on Foods and Nutrition

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.  
FRANKLIN C. BING, Secretary.

The Council on Foods and Nutrition of the American Medical Association records with deep sorrow the death, on February 1, of

**Mary Swartz Rose (Mrs. Anton R. Rose).**

Born at Newark, Ohio, on Oct. 31, 1874, the daughter of Judge Hiram E. Swartz; Mary Swartz Rose graduated from Denison University in 1901, studied home economics for a year at Mechanics Institute, Rochester, N. Y., and then entered Teachers College, Columbia University, where she received the degree of Bachelor of Science in 1906. She then studied at Yale University under Prof. Lafayette B. Mendel and received a Ph.D. degree in 1909. Her subsequent academic career was spent at Teachers College, where she held successively the posts in instructor of nutrition (1909-1910), assistant professor (1911-1918), associate professor (1918-1923) and professor (1923-1941).

Mrs. Rose was one of the outstanding teachers of her time. Through her classes at Teachers College she came to exert a wide influence on the development of nutrition and the teaching of this science in many institutions throughout the country. Through her writings, notably her books "Feeding the Family," "Foundations of Nutrition," "Everyday Foods in War Time" and "Teaching Nutrition to Boys and Girls," she brought her talents as a writer effectively to bear on the problem of education of the general public in matters concerning foods and nutrition. In the midst of these many activities she also proved that she could be a productive scholar adding to the sum total of scientific knowledge in this field. These contributions are recorded in a long list of papers reporting researches carried out in her laboratory with many students and colleagues. Mrs. Rose also played a part in organizing research workers in nutrition, being one of the founders of the American Institute of Nutrition. She served this organization as vice president in 1936 and president in 1937. Her further activities in this connection included service as a member of the editorial board of the *Journal of Nutrition*.

Because of her unusual qualities, she was also called on to render important public services. In 1918-1919 she held the position of Deputy Director of the Bureau of Conservation of the Food Administration, in 1935 she was appointed a member of the nutrition commission of the health organization of the League of Nations and in 1940 Dr. Rose was chosen one of a national group of five to serve as advisers on nutrition to the Council of National Defense and consultants to the committee on food and nutrition of the National Research Council. She was first appointed a member of the Council on Foods of the American Medical Association in 1933 and in this capacity rendered unstinting service for many years.

From this brief statement it is evident why Dr. Rose should have been elected to membership in the Council on Foods. To the Council's deliberations she brought a wide experience that touched not merely the academic sphere of interest but the general public welfare and education of both the public and the food industry, matters of great importance in relation to the work which the Council was established to perform. These councils were effectively rendered because they came from one who was imbued with much personal charm.

32651  
J. M. A. Medical College  
JAN 25 1941

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MAY 24, 1941

## THE HUMAN FACTOR IN MOTOR VEHICLE ACCIDENTS: PHYSICAL OR MENTAL DISABILITIES

The operation of a motor vehicle under the trying conditions of highway traffic today demands that the driver exercise constant vigilance and care, that he possess normal reactions, responses and judgment and that he be not so physically or mentally disabled as to be unable at any given time to respond to unusual situations. The use of any lower standard by any particular driver is a potential menace to the public. Indeed, most of the appalling present day traffic toll is attributed by some to such failure of the human factor.

Much consideration has been given by private citizens and agencies, by public officials and legislative bodies and by committees to the problem of highway safety. The human factor has not been overlooked; attempted means of control have been adopted, but unfortunately there are still almost countless instances of failure. All the states in the Union but three appear now to have laws prohibiting the operation of a motor vehicle except by a person licensed to do so by the appropriate state agency. The theory of these laws is that the applicant for a license to drive must demonstrate mastery of the simple traffic rules of the state, mechanical ability to drive, and physical and mental capacity to do so. The enforcement of these laws, however, has not as yet insured that safe drivers only are behind steering wheels. Possibly some of the more significant reasons for the failure of the laws to produce the desideratum are that (1) most of the laws permit the licensing without examination, or after a most cursory examination, of all persons who have operated a motor vehicle prior to the enactment of the particular law; (2) while an examination may indicate that a prospective licensee can operate a car safely, no test can ascertain the operator's willingness or constant endeavor in the future to do so, and (3) while most laws prohibit the issuance of a license to one who by reason of physical or mental disability is or may be

unable to operate a motor vehicle safely, the provision is largely ineffective unless the applicant is subjected to a competent medical examination. Few if any of the state laws contain adequate provisions in this respect.

Probably the failure of the human factor is due generally to the driver's relaxation of his willingness or endeavor constantly to drive safely. Carelessness, inattention or a willingness to drive while under the influence of alcoholic liquors or drugs to such an extent as to affect reactions, responses and discretion are frequently the basis of catastrophe.

The problems, however, with respect to those accidents attributable to physical or mental disabilities of the driver have not received the consideration that their importance justifies. Present drivers' licensing laws and other related laws are not sufficient to insure that operators of motor vehicles are mentally and physically capable of assuming control of such potentially lethal instruments as motor vehicles. These particular problems can never even approach solution until each applicant for a driver's license is subject to a thorough medical examination.

Most of the drivers' licensing laws prohibit the issue of a license to a person when the administrative authority "has good cause to believe that such person by reason of physical or mental disability would not be able to operate a motor vehicle with safety on the highways" or when it "has good cause to believe that the operation of a motor vehicle on the highways by such person would be inimical to public safety or welfare." Clearly, many disabilities that render a person an unsafe driver are not recognizable by the cursory examination now conducted by lay officials and might be discovered by a reasonably thorough medical examination. As matters now stand, a license may be refused for the reasons just stated or if, after the issuance of a license, a disability that renders the holder an unsafe driver is brought to light, the license may be revoked, suspended or canceled. Generally, however, such disabilities are brought to the attention of the licensing agency only after the occurrence of an accident.

To ascertain what persons are unfit mentally or physically to drive, it may be necessary to go further than merely to provide for the medical examination of applicants for drivers' licenses. Indeed, it may become necessary to require physicians and other persons to report instances of defects coming to their knowledge which might make another person unsafe as a driver of a motor vehicle. This suggested type of law may be necessary with respect to such conditions as epilepsy, which might not be ascertained even by a reasonably competent medical examination. As the law now stands in at least seventeen states a person who has been adjudged to be epileptic may not be licensed to drive and in at least twenty-three states, including the states just referred to, may not be licensed if he has a physical or mental defect causing a lack of reasonable

driving control. Presumably epilepsy would be so classified. The states referred to permit the revocation of a license for the reasons stated. Unfortunately, however, as intimated before, the licensing agency has no means of ascertaining such a disabling condition as epilepsy unless by some chance it learns of an accident occurring while the driver was in an epileptic fit. In but two states, so far as is known, is epilepsy a reportable disease. In California a law has recently been enacted<sup>1</sup> requiring all physicians to report to the local health officer concerning "every person diagnosed as a case of epilepsy or similar disorders characterized by lapses of unconsciousness." The local health officer must transmit the report to the state department of health, which in turn passes on the information to the state department of motor vehicles "in enforcing the provisions of the vehicle code of California." In New Jersey a report is required of the attending physician or other person having knowledge of the facts to agencies that eventually pass the report on to the state department of health—and not to the agency administering the drivers' licensing law. Laws requiring the reporting of such defects, together with laws requiring prospective drivers to submit to medical examinations to ascertain the presence of disabling mental and physical defects, should have an appreciable effect in making our highways safer.

#### FAT METABOLISM IN DIABETES MELLITUS

The ketonuria observed in the depancreatized dog and in the diabetic human being was early believed to be related to an altered carbohydrate metabolism. Hirschfeld<sup>1</sup> in 1895 showed that the factor common to all conditions of ketosis was the lack of carbohydrate in the food or, as in the diabetic patient, from his metabolism. The fact that ketosis appeared to be definitely related to carbohydrate starvation led many investigators to study the quantitative relationships between dietary carbohydrate and fat, on the one hand, and the degree of ketosis, on the other. From such investigations, notably by Zeller<sup>2</sup> and by Lusk<sup>3</sup> and his pupils, arose the hypothesis that the burning of carbohydrate in the body in some way prevents the appearance of ketosis and that carbohydrate is therefore "antiketogenic." The aphorism "fats, or acetone bodies, burn in the fires of carbohydrates" became the classic textbook description of fat metabolism in diabetes mellitus. From this arose the concept of ketogenesis and antiketogenesis. Rather striking confirmation of this hypothesis was provided in 1921 by the demonstration<sup>4</sup> that the oxidation of acetoacetic acid by

hydrogen peroxide in alkaline solution is catalyzed *in vitro* by the presence of dextrose; quantitative relationships between the amount of dextrose oxidized and the quantity of fatty acid burned were suggested on the basis of these experiments. Examination of the literature and calculations based on available clinical and experimental data led to the conclusion<sup>5</sup> that a striking correlation prevails between the extent of ketosis in experimental animals and in patients and the ratio of ketogenic to antiketogenic substances in the diet. From this and similar work, theoretically practical ratios for the dietary regulation of clinical ketosis, with particular reference to diabetes mellitus, were established.

Since 1928, however, evidence has accumulated which necessitates a complete revision of the concept of an obligatory coupling of the oxidation of carbohydrate and ketones. In that year Chaikoff and Soskin<sup>6</sup> demonstrated that injected acetoacetate was utilized by the muscles of the diabetic as well as by the normal eviscerated dog. More recently Blixenkrone-Møller<sup>7</sup> perfused the hind limbs of normal and diabetic cats and showed an active utilization of ketones by muscle. The extent of utilization was greatly increased in contracting muscle and it was concluded that ketone oxidation might furnish a large portion of the total energy requirements. Similar utilization and oxidation of ketones have been demonstrated in the peripheral tissues<sup>8</sup> of the intact rat, following phlorhizin or anterior pituitary administration, and in the muscle of both the normal and the depancreatized cat.<sup>9</sup> In the latter animal, obviously, the oxidation of ketones by muscle must be independent of the presence of insulin.

The oxidation of ketones in the peripheral tissues is apparently a process furnishing energy for the organism and taking place both in normal and in diabetic animals. The utilization of ketones by the tissues of diabetic animals, in the absence of normal oxidation of carbohydrate, clearly emphasizes the independence between the oxidation of carbohydrate and that of ketones. The clinical data which have been cited to support the obligate coupling of fat and carbohydrate metabolism have recently been reexamined and evaluated by Stadie,<sup>10</sup> who concluded that there is no significant relation between the ketone bodies utilized and the "antiketones" oxidized. This investigator postulates the following hypothesis of fat metabolism in diabetes mellitus as fulfilling the statistically significant facts derived from the clinical data: "Up to a certain level fat metabolism is complete and there is no ketonuria. Beyond this level fat metabolism is incomplete and part of the fat catabolized is excreted in the

5. Shaffer, P. A.: *Medicine* 2: 375 (Nov.) 1923.

6. Chaikoff, I. L., and Soskin, Samuel: *Am. J. Physiol.* 87: 58 (Nov.) 1928.

7. Blixenkrone-Møller, N.: *Ztschr. f. physiol. Chem.* 253: 261, 1938.

8. Harrison, H. C., and Long, C. N. II.: *J. Biol. Chem.* 133: 209 (March) 1940.

9. Stadie, W. C.; Zapp, J. A., Jr., and Lukens, F. D. W.: *J. Biol. Chem.* 132: 423 (Jan.) 1940.

10. Stadie, W. C.: *J. Clin. Investigation* 19: 843 (Nov.) 1940.

1. California Laws, 1941, chapter 186, approved April 29, 1941.

1. Hirschfeld, F.: *Ztschr. f. klin. med.* 28: 176, 1895.

2. Zeller, H.: *Arch. f. Physiol.* 1914, p. 213.

3. Lusk, Graham: *The Elements of the Science of Nutrition*, ed. 4. Philadelphia, W. B. Saunders Company, 1928.

4. Shaffer, P. A.: *J. Biol. Chem.* 47: 453 (July) 1921.

form of ketone bodies." Fat metabolism and, as a consequence, ketogenesis are accentuated in conditions of impaired carbohydrate utilization, diminished carbohydrate supply or accelerated fat and protein metabolism due to the injection of anterior pituitary extracts. Any of these circumstances augments ketone body production and is a manifestation of the increased demands which the body makes on the metabolic processes involving fat. The ketonemia and ketonuria which may result are a consequence of the failure of ketone utilization in the peripheral tissue to keep pace with the increased ketone production in the liver and, perhaps to a limited extent, in the muscles. Relationships between carbohydrate and fat metabolism which were formerly considered obligate are therefore related only in that both types of metabolism exist in the normal person, who derives his energy from both carbohydrate and fat oxidation, whereas the diabetic person, with impaired utilization of the former process, must necessarily depend almost wholly on the latter reaction for his energy. Under these circumstances ketone body production exceeds utilization, and ketonemia and ketonuria are evident. The administration of insulin renews the possibility of completing carbohydrate oxidation; the amount of fat which must be processed becomes less and production of ketone bodies diminishes.

### Current Comment

#### THE DISTINGUISHED SERVICE MEDAL

The Distinguished Service Medal of the American Medical Association will be presented for the fourth time at the opening meeting at the annual session of the Association in Cleveland, June 2. The method of selection of the recipient of the Distinguished Service Medal is defined in the By-Laws of the Association. Any Fellow of the Association may submit nominations and these should now be sent promptly, together with a record of the scientific services of the nominee, to the chairman of the Committee on Distinguished Service Awards, Dr. Alfred A. Walker, 2250 Highland Avenue, Birmingham, Ala., or to Dr. Olin West, Secretary of the American Medical Association, 535 North Dearborn Street, Chicago. Of the nominations received by the committee, five will be submitted to the Board of Trustees of the Association and from these the board will select three to be submitted to the House of Delegates. Immediately on submission of the nominations of the Board of Trustees, the House of Delegates by vote selects the one to whom the Distinguished Service Medal will be presented on the evening of the following day. Obviously an extended list of distinguished physicians nominated by Fellows of the Association for this award will enable the committee, the Board of Trustees and the House of Delegates, all of whom participate in the selection, to determine for 1941 a recipient whose nomination again will reflect favorably not only on himself but on the Association.

#### REGISTRATION UNDER HARRISON NARCOTIC ACT

Annually for many years *THE JOURNAL* has given timely warning to physicians that reregistration under the Harrison Narcotic Act must be effected on or before July 1 of each year. Despite these repeated warnings some physicians continue to overlook this requirement and later are subjected to an inconvenience and to the necessity of paying the penalty for their tardiness. One physician who became involved because of his failure to reregister in time actually complained because *THE JOURNAL* had not forewarned him. Now *THE JOURNAL* again calls attention to the fact that on or before July 1 every physician registered under the Harrison Narcotic Act or under the Marihuana Tax Act must reregister with the collector of internal revenue of each district in which he maintains an office or a place for the treatment of patients. Failure to reregister within the time allowed by law adds a penalty of 25 per cent to the amount of the annual tax payable at the time of registration and in addition makes the physician in default liable to a fine not exceeding \$2,000 or to imprisonment for not exceeding five years or both. The Commissioner of Internal Revenue has given some negligent or recalcitrant physicians the choice between paying substantial sums by way of compromise in lieu of the penalties for their offenses or, as an alternative, accepting criminal prosecution with resultant publicity and liability to fines and possible imprisonment. This practice on the part of the Commissioner of Internal Revenue is warranted by law. In each instance, moreover, it is an act of grace on the part of the Commissioner, for he might have instituted criminal prosecutions without allowing the offending physicians any choice in the matter. If the course that the Commissioner has followed does not produce the desired promptness in registration, there is no recourse other than criminal prosecution to attain the result.

#### MEDICINALS IN CHINA

War frequently brings about unlooked for changes. One of these is the reversal in attitude by the masses of the rural population in China toward Western medicines. The customary antipathy in this respect has been largely dispelled; Chinese manufacturers of medicinals are looking forward to an expansion of their trade in the future. The opening of transportation routes to the interior resulting partly from the exigencies of war also is playing a part in increasing trade in medicinals in China. The greater part of China's requirements in pharmaceutical, medicinal and biologic preparations are met by imports the approximate value of which reached \$5,775,000 in 1939.<sup>1</sup> Nevertheless, the domestic industry has expanded and within the past year great progress has been made in the manufacture of biologic preparations, though 70 per cent of the ingredients are still imported. The fact that eight large manufacturing establishments in Shanghai are producing proprietary medicines, vaccines, serums, antiseptics, anesthetics and general hospital supplies gives an idea of the activity in this field.

<sup>1</sup> News Edition, *J. Am. Chem. Soc.* **19**: 261 (March) 1941.

# MEDICAL PREPAREDNESS

*In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.*

## DIAGNOSIS AND TREATMENT OF THE VENEREAL DISEASES

### CIRCULAR LETTER NO. 18

Prepared by the Subcommittee on Venereal Diseases of the Committee on Chemotherapeutic and Other Agents

An outline of the use of chemotherapeutic agents in the treatment of infectious diseases and other infections as recommended by the Committee on Chemotherapeutic and Other Agents and its Subcommittee on Infectious Diseases of the Division of Medical Sciences, National Research Council, was published in Circular Letter No. 81, dated Dec. 5, 1940.

The following outline on the diagnosis and treatment of the venereal diseases records briefly the opinions and recommendations of that committee and its subcommittee on venereal diseases. The data on which this circular letter is based have been prepared by the Subcommittee on Venereal Diseases and approved by the Committee on Chemotherapeutic and Other Agents.

The instructions contained in paragraph 29, Circular Letter No. 1, Jan. 2, 1940, in conflict with this circular letter, are rescinded.

The Subcommittee on Venereal Diseases, chairman, J. E. Moore, is composed of J. E. Moore, associate professor of medicine, Johns Hopkins University School of Medicine, Baltimore; Edwin P. Alyea, associate professor of surgery, Duke Medical School, Durham, N. C.; Charles W. Clarke, American Social Hygiene Association, New York; Oscar F. Cox Jr., secretary, American Neisserian Medical Society, Boston; J. F. Mahoney, Senior Surgeon, United States Public Health Service, Venereal Disease Research Laboratory, Staten Island, N. Y., and John H. Stokes, professor of dermatology and syphilology, University of Pennsylvania School of Medicine, Philadelphia.

Because of the rapid development of chemotherapeutic agents, it is likely that some of these recommendations will have to be modified from time to time. Certain measures other than chemotherapeutic are described where appropriate. These recommendations are published as a general guide for medical officers and are to be used at their discretion, with due consideration of all other factors which may be presented by each individual case. It is not intended that they should be used to the exclusion or neglect of other indicated therapeutic or nursing procedures.

Treatment of the following diseases is discussed:

1. Gonorrhea.
2. Syphilis.
3. Chancroidal infection.
4. Lymphogranuloma venereum.
5. Granuloma inguinale.

### GNORRHEA

*A. Diagnosis in Males.*—1. A diagnosis of gonorrhea must not be made in the absence of laboratory confirmation (although in emergencies, when laboratory

facilities are not available within twenty-four hours, patients with acute purulent urethral discharge should be started on treatment for gonorrhea).

2. Acute gonorrhea (anterior urethritis) is diagnosed on the basis of a purulent urethral discharge with positive gram staining for gonococci.

3. Chronic gonorrhea (posterior urethritis, prostatitis, seminal vesiculitis, arthritis) may be diagnosed on the basis of the results of gram staining of urethral discharge or of prostatic secretion revealing gonococci or by culture of appropriate body fluids.

4. Gonorrheal ophthalmia is an acute purulent conjunctivitis, rapidly progressing to involve other external coats of the eye, the secretion revealing gonococci by gram staining.

*B. Diagnosis in Females.*—1. Definite diagnosis of early gonorrhea in women is more difficult than in men.

2. Diagnosis should be based on: (a) History: (1) Symptoms (dysuria, vaginal discharge, vulvar pruritus, pelvic inflammation, acute arthritis). (2) Exposure to known gonorrhea.

(b) Clinical examination, especially abdominal, pelvic and rectal (especially important in cases of chronic gonorrhea).

(c) Gram staining of secretion from the urethra, Bartholin's glands, the cervix and the rectum. (Caution: The normal genital flora may contain organisms which closely resemble gonococci.)

(d) Culture, which should always be performed if smear findings are not corroborated by history and physical examination.

*C. Treatment of Acute Gonorrhea in Males or Females.*—1. Local treatment (for males). (a) Local treatment (irrigations, instillations or other procedures) should not be used in any form except for patients resistant to the sulfanilamide compounds or for those with complications (posterior urethritis, prostatitis, seminal vesiculitis) and then only by specially trained personnel in the dispensary or hospital. In cases of the acute condition local treatment may do more harm than good.

2. Local treatment (for females). (a) In the acute stage, external cleanliness only; no douches.

(b) For acute pelvic inflammatory disease rest in bed, application of ice bags to the abdomen, keeping the bowels open (if enemas are necessary, clean the perineum carefully before inserting the rectal tube, to avoid infecting the rectum) and hot cleansing douches.

3. Chemotherapy. (a) Even under ambulatory conditions, acute gonorrhea may be cured by appropriate measures in a large proportion of cases. Therefore, when considered desirable and local conditions permit, acute gonorrhea may be treated on an ambulatory basis in working quarantine (paragraph 7, AR 40-235, Oct. 11, 1939). Under such conditions hospitalization will be necessary for the treatment of complications.



(b) Sulfathiazole and sulfapyridine are better than sulfanilamide.

(c) In the doses to be advised, neither sulfathiazole nor sulfapyridine is likely to cause serious toxic manifestations.

(d) If sulfathiazole fails, use sulfapyridine (see following sections). If neither is available, use sulfanilamide.

(e) Other medication by mouth (such as copaiba, sandalwood oil or alkalis) is unnecessary and should not be used.

**D. Determination of Cure (in Males).—**The following procedure should be carried out, on the fourteenth to twentieth day after the start of treatment and if all symptoms have disappeared:

1. Before the patient voids, massage the prostate with sufficient vigor to obtain secretion.

2. Examine the secretion for pus and gonococci by the gram stain.

(f) *Treatment Scheme for Acute Gonorrhea\**

Day Plan (Inclusive)	Drug	Plan A		Daily Administration
		Dully Dose, Gm.	Each Dose, Gm.	
1st	Sulfathiazole	3.0	0.5	Every 3 hr., 6 a. m. to 9 p. m.
2d to 4th	Sulfathiazole	2.0	0.5	Every 5 hr., 6 a. m. to 9 p. m.
5th	Examine patient. If discharge persists, stop sulfathiazole and switch to plan B. If symptoms have disappeared, continue plan A, as follows:			
5th to 10th	Sulfathiazole	2.0	0.5	Every 5 hr., 6 a. m. to 9 p. m.
10th	If patient remains symptom free, stop all treatment			
10th to 14th	None			
14th	Proceed with determination of cure (see D)			

Plan B				
To be used for sulfathiazole-resistant patients on fifth day				
5th	Sulfapyridine	3.0	0.5	Every 3 hr., 6 a. m. to 9 p. m.
6th to 10th	Sulfapyridine	2.0	0.5	Every 5 hr., 6 a. m. to 9 p. m.
10th	Examine patient. If discharge persists, stop sulfapyridine, and if patient is not already in hospital transfer to hospital for special care			
	If symptoms have disappeared, continue plan B as follows:			
11th to 15th	Sulfapyridine	2.0	0.5	Every 5 hr., 6 a. m. to 9 p. m.
16th	If patient remains symptom free, stop all treatment			
16th to 20th	None			
20th	Proceed with determination of cure (see D)			

\* Before treatment, a careful inquiry should be made as to previous treatment with sulfanilamide or its derivatives, special care being taken to exclude the possibility of self-administered chemotherapy. See also paragraph 12, Circular Letter No. 81, Dec. 5, 1940 (general comment on toxic effects).

3. If no gonococci are found, repeat this procedure weekly for eight weeks. If the result is negative for eight weeks, discharge the patient as cured. Supporting evidence of culture is desirable (see F).

4. If on any of these occasions the prostatic secretion contains gonococci on smear or culture, repeat plan A, using sulfapyridine instead of sulfathiazole (dosage identical), and in addition gently massage the prostate twice weekly.

5. The passage of instruments into the urethra and/or indulgence in alcohol or sexual excitement are not recommended as criteria of cure.

**E. Determination of Cure (in Females).—**1. Make a pelvic examination for masses or discharge.

2. Examine smears (gram stain) from the urethra once every two weeks for three months.

3. Confirm negative or positive results of urethral smear examinations by culture of material from the urethra and the cervix at monthly intervals on the last day of the menstrual period.

4. To obtain material for smear and culture, massage the urethra and Skene's glands. Use a bivalve specu-

lum to expose the cervix. Do not use a lubricant on the speculum. Cleanse the external os with dry cotton. Squeeze the cervix gently with the blades of the speculum. Remove material with a platinum loop or a cotton-wound applicator for smear. Use a cotton-wound applicator for removal of material for culture.

5. If no gonococci are found by smear or culture during three or four months of post-treatment observation, discharge the patient as cured.

6. If on any of these occasions gonococci are found by smear or culture, repeat plan A, using sulfapyridine instead of sulfathiazole.

**F. Cultures in Determination of Cure.**—Absolute proof of cure of gonorrhea demands a minimum of three consecutive negative cultures of prostatic secretion for men (at two week intervals) or of secretion from the cervix and the urethra for women (not oftener than at monthly intervals). If cultures are not available, determination of cure must depend on gram-stained smears.

**G. Local Treatment for Sulfanilamide-Resistant Patients or Those with Complications Arising During Treatment (Posterior Urethritis, Prostatitis and so on).**—When local treatment is necessary, it should be given at dispensaries or hospitals by specially trained personnel.

1. For sulfanilamide-resistant anterior urethritis: (a) Daily until discharge ceases, gently irrigate the anterior urethra with 1,000 cc. of warm 1:5,000 potassium permanganate solution by the gravity method, with the reservoir not more than 1 meter above the meatus. Do not distend the urethra.

(b) Daily until discharge ceases, inject not more than 8 cc. of 5 to 10 per cent mild protein silver solution into the anterior urethra (solution not more than one week old); retain for three minutes by having the patient compress the meatus with a thumb and a finger.

(c) All irrigations and instillations should be administered by a medical officer or a trained attendant, not by the patient.

2. For the active stage of posterior urethritis occurring as a complication of treatment: (a) Stop all local treatment until acute symptoms have subsided.

(b) Give hot hip baths for painful urination.

(c) Resume daily irrigations of the anterior urethra with potassium permanganate solution 1:5,000 when acute symptoms have subsided.

(d) After a week during which the first glass of urine has been nearly clear and the second glass entirely so, gently stroke the prostate before the patient voids. If this causes a persistent urethral discharge or results in symptoms of active posterior infection, do not repeat until the patient has been free from symptoms, the first glass of urine nearly clear and the second glass entirely so for one week.

(e) If the first massage does not cause any activation of signs or symptoms, repeat massage of the prostate twice a week and increase the pressure gradually until the pressure is fairly firm. Continue prostatic massage until the prostatic secretions become negative for gonococci.

(f) Make microscopic studies of prostatic secretion once a week for at least eight weeks. If all give negative results, discharge the patient as cured. (Cultures of prostatic secretions should be made if facilities are available.)

3. Posterior urethritis, epididymitis, acute prostatitis, acute seminal vesiculitis and acute arthritis arising as



complications of treatment require hospital care. If one of these complications is the original manifestation which brings the patient under medical observation, it will be frequently controlled by a day or two of ambulatory chemotherapy.

4. Chronic prostatitis, symptomless and manifested only by pus in the prostatic secretions, will, in general, be allowed to go untreated. Prolonged courses of prostatic massage are valueless.

H. *Serologic Follow-Up of Patients with Gonorrhea.*—As far as possible all patients, male and female, acquiring acute gonorrhea should have a serologic test for syphilis done on admission and at least one follow-up test in order to rule out symptomless infection with the latter disease. If only one such test is done, it should be performed three or four months after the onset of gonorrhea.

#### SYPHILIS

A. *General Principles of Treatment.*—1. No treatment is to be given for suspected early syphilis until the diagnosis is made either by dark field examination or by confirmed serologic tests. No therapeutic tests are to be used.

2. Begin with an arsenical for early and latent syphilis (one-half full dose initially followed by full doses) with a bismuth compound for late syphilis.

3. The preferred arsenical in and out of hospital is mapharsen (arsenoxide). When mapharsen is not available, neoarsphenamine may be used. The preferred bismuth preparation is bismuth subsalicylate. In the hospital under competent direction, arsphenamine or another arsenical may be employed.

4. Tryparsamide and fever therapy are not to be used outside a hospital.

5. The range of dosage of mapharsen is 30 to 60 mg. per intravenous injection, of neoarsphenamine 0.45 to 0.9 Gm., of arsphenamine 0.3 to 0.6 Gm., of bismuth subsalicylate 0.2 Gm. the average normal dose.

6. A course of arsenical treatment is eight weekly intravenous injections. A course of bismuth therapy is ten weekly intramuscular injections. A normal rest period, when allowed, is eight weeks.

7. Treatment is to be of the continuous alternating type, i. e. without rest periods between courses and with arsenical courses alternating with bismuth courses—not alternate injections or simultaneous injections of the two drugs except as indicated for overlap.

8. Each treatment is to be recorded on the syphilis register of the patient. If for any reason a syphilis register is not available, a written record is to be kept and transferred to the standard form as soon as possible.

9. Each entry will include date, drug, dose and reaction.

10. It cannot be too strongly emphasized that clock-like calendar regularity of the treatment schedule without long or short time variations or lapses is critically important to both the control and the cure of infection. It is most important in the first twelve months. Every effort must be made to impress this fact on enlisted men and officers as well as on medical personnel on all occasions.

11. Emphasis should also be placed on the completion by each patient of the full schedule of treatment in the time called for by the type of infection presented, discarding serologic tests as guides, so-called "abortive" procedures for seronegative primary syphilis or "treatment to noninfectiousness."

12. The infectiousness of syphilis is not to be predicated on the result of a blood test but is judged by the total time, course, laboratory tests, physical inspection and treatment summation of the case.

B. *Serologic Controls in Treatment.*—1. Patients with early syphilis (first two years of infection) are to have a serologic test of the blood:

- (a) At the start of treatment.
- (b) With the second treatment if the reaction is negative at the start.
- (c) At the sixteenth week (average positive reaction should become negative).
- (d) At the twenty-fourth week (positive reaction indicates need for spinal fluid examination).
- (e) At the beginning and end of each course of bismuth therapy thereafter.
- (f) Once in three months during two years of post-treatment probation.
- (g) Before discharge from service at any time.

2. Patients with early syphilis are to have a test of the spinal fluid:

- (a) Between the twenty-fourth and the fifty-second week in all cases.
- (b) If fluid is abnormal, repeat at least once in six months.
- (c) If weak or strong positive reactions appear in the blood after negative ones.

3. Early latent syphilis (first four years of the infection) is to be considered early syphilis in serologic controls as to both blood and spinal fluid.

4. Patients with latent syphilis (after fourth year of infection of uncertain duration) are to have a test of the blood once in three months whether on treatment or probationary observation. (Thirty per cent irreversible reactions are to be expected.)

5. Patients with latent syphilis are to have a test of the spinal fluid:

- (a) As soon after treatment is begun as practicable.
- (b) If after a series of negative reactions the reaction of the blood becomes positive.
- (c) Before discharge, if practicable, unless there has previously been a negative reaction.

C. *Control of Relapse and Infectiousness.*—1. Early syphilis is to be regarded as infectious until the second injection has been given and should be rated potentially infectious if treatment for any reason is irregular or inadequate (subschedule).

2. Physical inspection of the skin (including palms and soles), mucosae, anus and genitalia should be performed as often as circumstances permit during treatment and at each probationary inspection.

3. Patients should be warned to look for and report oral, cutaneous and genital lesions.

4. The involution of the chancre or secondary symptoms should be watched to detect treatment-resistant conditions.

5. Dark field examination is of great help in recognizing cutaneous, mucosal and genital relapse lesions. The blood test may give a negative reaction.

6. Relapsing or treatment-resistant infectious types of syphilis require special consideration with a view to effective therapy and quarantine control.

D. *Treatment Interpretation of Spinal Fluid Observations.*—1. Reports on the spinal fluid should include:

- (a) Quantitative complement fixation test.
- (b) Total protein or standard globulin test.
- (c) Differential cell count.
- (d) Colloidal test. The fluid should be bloodless.

2. Minimal abnormality. Slight increase in protein (Pandy, plus-minus to 1 plus) or a leukocyte count over 5. Continue with standard treatment; recheck at or before probation.

3. Grade I. Blood reaction positive or negative, spinal fluid Wassermann reaction negative, leukocyte count 10 to 25, protein 1 plus, colloidal gold curve low second zone (syphilitic). Patient recovers with continuance of standard treatment. Recheck in six months.

4. Grade II. Blood reaction positive or negative, usually positive, spinal fluid Wassermann reaction positive in low dilutions, negative in high dilutions, leukocyte count 5 to 100 plus, protein 2 plus, colloidal gold curve pronounced second zone (syphilitic). Patient recovers under prolongation and intensification of standard intravenous and intramuscular treatment.

5. Grade III. Blood reaction strongly positive; spinal fluid Wassermann reaction strongly positive with all dilutions; leukocyte count 7 to 100 plus; protein 3 plus; colloidal gold curve first zone (dementia paralytica). Patient will not recover without tryparsamide and/or fever therapy. Should be sent to the hospital as soon as practicable.

E. *Prevention of Reactions.*—1. A physical examination and a urinalysis should precede the institution of treatment.

2. Minimal medical inspection should be made before each treatment.

The neck and arms should be exposed. Inspect:

- The face for edema of eyelids and dermatitis.
- The open mouth for bleeding gums, petechiae.
- The scleras for jaundice.
- The elbow flexures and wrists for dermatitis, petechiae.
- Signs of intercurrent infection or fever. Any positive finding demands closer examination.

Questions: Patient sick after last treatment? Bowels loose? Urine dark? Skin itch? Any rash? Gums or nose bleed? Stool black? Pain in arm or hip? These questions may if practicable be posted in sight of the patients and pointed to by persons giving treatment.

### 3. Technical suggestions:

- Discard discolored drugs and solutions and damaged ampules.
- Shake and aerate mapharsen. Do not shake or aerate the other arsenicals.
- Inject mapharsen rapidly to avoid thrombosis (no danger of speed shock or nitritoid crisis). Other arsenicals should be injected *slowly* (speed shock, nitritoid crisis).
- Thoroughly shake oily suspensions.
- Aspirate on a syringe after insertion of the needle before injecting anything, especially intramuscularly.
- Inject intramuscularly into the inner angle of the upper outer quadrant of the buttock. Alternate.
- Massage long and firmly after withdrawing the needle from the buttock.
- Have the patient prolong the massage to three minutes.
- Rest should be ordered if practicable after administration of arsenicals; exercise after intramuscular injections.
- Warn the patient to report his reactions.
- Test the urine once in two to four weeks. Do not stop or modify treatment for slight albuminuria or cylindruria.
- Watch the mouth and the gums; use hydrogen peroxide or some other oxidant and an astringent. Dental attention should be given.

### 4. General antireaction therapy:

- Epinephrine hydrochloride solution 1:1,000 from 6 to 10 minims (0.36 to 60 cc.) subcutaneously for speed shock or nitritoid crisis.

(b) Dextrose 500 cc. of 5 per cent solution intravenously for jaundice or dermatitis.

(c) Venesection (400 cc.) for threatened cerebral accidents.

(d) Liver extract given intramuscularly is occasionally helpful for suspected damage to the liver.

(e) For cerebral vascular accidents, hypertonic saline solution intravenously 500 cc. (1.5 per cent).

(f) For blood dyscrasias, transfusions.

(g) The value of sodium thiosulfate for any type of treatment reaction is questionable.

5. Treatment is to be stopped and the patient hospitalized if any of the following symptoms appear:

- An itchy dermatitis of the face and flexures.
- Jaundice.
- Petechial or other hemorrhagic lesions.
- Evidence of cerebral injury, even though slight.

6. If treatment is stopped because of reaction, medical consultation as to further procedure should be had as promptly as possible, especially for patients with early syphilis.

F. *Cardiovascular, Visceral and Resistant (Grade 3) Neurosyphilis.*—Cardiovascular, visceral and symptomatic and asymptomatic neurosyphilis with grade III spinal fluid require special treatment in a hospital. For additional details see standard textbooks.

G. *Treatment of Precocious Late Syphilis (Tertiary).*—As soon as possible, patients with precocious late syphilis (early gummatous and rupial lesions and bone lesions following lapse after inadequate heavy metal coverage of arsenical treatment) should be hospitalized for combined fever and arsenical therapy.

H. *Treatment of Congenital Syphilis.*—On recognition or on appearance of active lesions, congenital syphilis should be treated on the schedule of early syphilis.

### 1. Diagnostic Nomenclature for Syphilis in the Army.—

Primary  
Secondary early  
Secondary relapsing  
Latent

#### Tertiary:

Mucocutaneous	Visceral
Osseous	Other (specify)
Ocular	

#### Cardiovascular:

Aneurysm (saccular)	Aortitis, uncomplicated
Aortic regurgitation	

#### Neurosyphilis:

Asymptomatic	General paresis (dementia paralytica)
Acute syphilitic meningitis	Gumma
Diffuse meningovascular	Syphilis with psychosis (other than general paresis [dementia paralytica])
Tabes dorsalis	
Taboparesis (the tabetic form of dementia paralytica)	

#### Congenital

##### Type undetermined

Poisoning from arsphenamine (include all arsphenamines and mapharsen)

##### Specify nature, as

Jaundice	Hemorrhagic encephalitis
Dermatitis	Other (specify)
Blood dyscrasia	

Poisoning from trypanarsamide (specify nature):

Amblyopia
Dermatitis

Poisoning from bismuth (specify manifestation)  
Poisoning from mercury (specify manifestation)  
Poisoning from iodides (specify manifestation)  
Fever therapy for syphilis  
Malaria inoculata                      Other (specify)  
Mechanical fever

No disease, spinal puncture

The terms will be used as follows:

1. Primary. To include conditions presenting the primary lesion of syphilis (the chancre) which have not yet shown secondary manifestations. This diagnosis must be confirmed by dark field examination, a serologic test of the blood or both. If the serologic test of the blood is negative, the diagnosis of primary syphilis is not permissible without the demonstration of *Spirochaeta pallida* by dark field examination.

2. Secondary, early. To include only those examples of early syphilis which show one or more of the manifestations of systemic dissemination of the spirochete, for example, generalized enlargement of lymph glands, cutaneous eruption, mucous patches, condylomata lata, patchy alopecia, laryngitis, pains in the bones and febrile reaction. The chancre may or may not be present and, if present, may be in any stage of evolution. In early secondary syphilis the manifestations of systemic spirochetal dissemination are increasing, have attained their maximum or are waning. This diagnosis must be confirmed by dark field examination, a serologic test or both.

In cases of early secondary syphilis and in addition to the manifestations listed, ocular or neurologic complications (iritis, neuroretinitis, acute syphilitic meningitis) should be specially recorded as "Syphilis, secondary, early: Manifested by . . ."

3. Secondary, relapsing. In relapsing secondary syphilis a second systemic dissemination of the spirochete has taken place, usually because of premature cessation of arsenical therapy. The commonest time for relapse is within the first six months, and the majority of all early relapsing infections occur within the second year. In addition to the relapsing lesions of skin and mucous membrane which may be observed there may also occur other relapsing lesions, particularly in the eye and in the nervous system. These should be reported as "Syphilis, secondary, relapsing. Manifested by . . ."

4. Latent. Secondary symptoms have subsided, and the active manifestations of late syphilis have not yet supervened. There are no evidences of syphilis other than a positive serologic reaction of the blood. The condition will not be classified as latent unless asymptomatic neurosyphilis has been excluded by a negative result of examination of the spinal fluid. The date of such examination of the spinal fluid will be stated in all cases in which the disease is diagnosed as "latent," as follows: "Spinal fluid negative . . ." Cases in which there is no evidence of syphilis other than a positive serologic reaction of the blood and in which involvement of the central nervous system has not been excluded by examination of the spinal fluid are to be reported as instances of "Syphilis, type undetermined, spinal fluid not examined. Manifested by . . ."

5. Tertiary. This classification is to be used only in cases of active lesions of late syphilis other than involvement of the central nervous system and the cardiovascular system. The lesion may be a gumma or it may be a diffuse process. It may involve any

organ or tissue of the body. If the central nervous system or the cardiovascular system is involved, however, these cases will not be reported as instances of tertiary syphilis but, because of their gravity and frequency and the necessity for specialized treatment, will be reported as cases of neurosyphilis or of cardiovascular syphilis, as the case may be.

The majority of all examples of tertiary syphilis other than cardiovascular syphilis or neurosyphilis will fall within four categories: mucocutaneous (late syphilitic gummatous lesions of skin or mucous membranes); osseous (periostitis, osteomyelitis, arthritis, synovitis); ocular (iritis, uveitis, keratoiritis, keratitis, choroiditis, but not including optic atrophy), and visceral (hepatic, gastric).

In such cases special diagnoses should be made:

"Syphilis, tertiary, mucocuta-      "Syphilis, tertiary, ocular"  
neous                                      "Syphilis, tertiary, visceral"  
"Syphilis, tertiary, osseous"

If tertiary manifestations occur which do not fit into one of these categories, diagnose as:

"Syphilis, tertiary, other" (specify).

6. Cardiovascular. To include all lesions of the heart and great vessels.

(a) Aneurysm (saccular). Do not use for a fusiform dilatation of the aorta. Specify artery involved.

(b) Aortic regurgitation. Specify whether with or without cardiac decompensation.

(c) Aortitis, uncomplicated. To be used only for patients with symptoms and physical or roentgen signs of syphilitic aortic involvement in the absence of aneurysmal sacculation or aortic regurgitation.

7. Neurosyphilis. To include all syphilis with involvement of the central nervous system, classified further as follows:

(a) Asymptomatic. To be used only for patients with early or late syphilis who have no symptoms or detectable physical signs of involvement of the central nervous system and in whose cases the diagnosis is based on the routine finding of abnormalities in the spinal fluid.

(b) Acute syphilitic meningitis. This usually occurs within the first two years of the disease, most commonly as a relapse phenomenon (neurorrecurrence), manifested by the usual signs of low grade meningeal involvement with or without cranial nerve palsies.

(c) Diffuse meningovascular. This is a catch basket category to include neurosyphilis which does not fit into other diagnostic categories enumerated. Manifestations to be stated in each instance.

(d) Tabes dorsalis. "Neurosyphilis, tabes dorsalis. Manifested by . . ."

(e) Taboparesis (the tabetic form of dementia paralytica). To be used only for patients with definite psychiatric signs of paresis complicated by definite clinically demonstrable evidence of damage to the posterior columns of the spinal cord.

(f) General paresis (dementia paralytica). To be limited to patients who show psychic changes in addition to neurologic signs and the characteristic changes in the spinal fluid. Patients with parietic (dementia paralytica) type spinal fluid but without psychic changes will be reported under "Syphilis, diffuse meningovascular. Manifested by . . ." or under some other type of neurosyphilis.

(g) Gumma. Include gumma of brain and spinal cord only. Gumma of other organs or tissues to be reported as "Syphilis, tertiary. Manifested by . . ."

(h) With psychosis. To include neurosyphilis with psychosis (other than that associated with paresis and taboparesis).

8. Congenital. To be used only when there is definite evidence of the existence or former existence of the

characteristic changes of congenital syphilis, such as interstitial keratitis, Hutchinson teeth, saber shins and other bone changes, saddle nose and eighth nerve deafness. The congenital origin of syphilis is not to be assumed merely because time and the circumstances of the infection cannot be ascertained and there is no scar of a primary lesion.

9. Type undetermined. To include conditions accurate diagnosis of which has not been made. Every effort should be made to make a complete examination and proper diagnostic classification in all cases.

The suggested terms for various drug poisonings are intelligible as they stand.

Fever therapy. It is particularly desirable to diagnose especially the conditions of patients treated with fever and to specify the type of fever employed.

The manifestations of the disease will be given in each case. The lesions will be located and briefly described. The results of laboratory procedures will be stated.

The diagnosis of syphilis shall not appear in the records of any person unless the presence of the disease has been established. For that reason patients for whom such a diagnosis has not been definitely made will not be recorded at any time as "Under observation for syphilis."

When syphilitic patients under treatment or during post-treatment observation are admitted to or retained in the hospital for follow-up examination (including spinal puncture) and when no new developments are found which justify a change or an addition to the original diagnosis as to syphilis, the diagnosis for that hospital admission or portion thereof due to observation for syphilis shall be recorded as syphilis, old, of the type in existence at the time of admission or retention in the hospital, unless all tests for syphilis give negative results and the patient can be pronounced cured, in which case the diagnosis shall be recorded as "Under observation (syphilis); no disease."

#### CHANCROIDAL INFECTION

A. *Definition*.—Chancroid is a venereal disease transmitted only by direct contact and characterized by single or multiple genital ulcers possessing irregular crater-like margins, usually with nonindurated base and a tendency toward the formation of complicating suppurating inguinal adenitis. The incubation period is usually three to fourteen days.

B. *Diagnosis*.—It is important to rule out the presence of mixed syphilitic and chancroidal infection. For this purpose all local medication should be withheld until three dark field examinations of material from accessible lesions, carried out on successive days, have given negative results. During this period saline solution dressings alone should be used. A serologic test of the blood for syphilis must be secured and the Frei test for lymphogranuloma venereum should be carried out if possible. Tests of the blood for syphilis should be made at monthly intervals for six months after healing of the chancroidal lesions. Laboratory tests for the absolute diagnosis of chancroid (Ito-Reenstierna cutaneous test or staining or culture isolation of the *Ducrey bacillus*) are not recommended.

C. *Treatment*.—Chemotherapy: (a) Local. Accessible lesions should be cleansed with soap and water and dried. They should then be completely covered with powdered sulfanilamide and a loose, dry dressing applied. This should be repeated at daily intervals until

the lesion heals. In patients with tight phimosis and underlying ulcerative lesions the phimotic preputial cavity should be irrigated twice daily with 1:5,000 potassium permanganate solution.

(b) Systemic. Administer sulfanilamide 3 Gm. daily for five days, utilizing divided doses at four hour intervals. For nine succeeding days administer sulfanilamide 2 Gm. daily, also in divided doses. At the end of fourteen days discontinue all chemotherapy.

Practically all chancroidal infections will respond to this routine. In fact, if the lesion does not heal, doubt is cast on the correctness of the diagnosis of chancroid and the patient should be restudied from the diagnostic standpoint and, if necessary, treated surgically.

(c) Surgical. Surgical procedures designed to relieve phimosis or paraphimosis should be resorted to only on the basis of sound clinical judgment.

(d) For chancroidal bubo. Most lesions of this type will subside with systemic sulfanilamide therapy. If extensive suppuration is already present or occurs, the bubo may be opened by a small incision, the pus aspirated and the cavity packed with sulfanilamide powder.

#### LYMPHOGRANULOMA VENEREUM

A. *Definition*.—This disease concept includes the conditions formerly known as lymphogranuloma inguinale, lymphopathia venerea, climatic bubo, esthiomene and inflammatory rectal stricture.

B. *Etiology*.—Condition caused by a filtrable virus, probably multiple strains.

C. *Geographic Distribution*.—Worldwide, most frequent in the tropics.

D. *Clinical Picture*.—A systemic disease of the lymphatic vessels and structures, usually originating in a trivial and transitory lesion of the penis, vulva, vagina or rectum, which frequently escapes the patient's notice.

The invasion of the lymphatic glands usually occurs from ten to thirty days after infection but occasionally is delayed for months. Inguinal adenitis is often bilateral and occasionally subsides without suppuration. During this stage constitutional symptoms may be observed. Lymph nodes may fuse to the skin, resulting in multiple areas of softening followed by numerous fistulas. Extensive scarring accompanies healing. The anorectal symptom is usually found in the female and is characterized by rectal pain, discharge of blood and pus from the anus, a tendency toward extreme chronicity and the production of rectal stricture.

E. *Diagnosis*.—Differentiate from malignant tumors, Hodgkin's disease, tularemia, tuberculosis, pyogenic infections, chancroidal bubo and syphilis.

F. *Specific Diagnosis (Frei Test)*.—In an infected person, intracutaneous injection of Frei antigen (0.1 cc.) gives rise to an inflammatory papule at least 0.5 cm. in diameter, often with peripheral erythema and sometimes with a central vesicle. The papule appears within forty-eight hours and persists for several days.

In infected persons the Frei test may give positive results for years. In suspected cases in which the test gives negative results, it should be repeated. Positive reactions occur in over 95 per cent of cases after the development of the bubo.

Mixed venereal infections should be ruled out by the dark field examination of material from genital lesions for the causative organism of syphilis. Frequent serologic examinations should be continued for at least six months after the disappearance of the lymphatic symptoms.

**G. Treatment.**—1. Local treatment: Patients with acute inguinal adenitis should be hospitalized whenever possible. The fluctuant nodes may be aspirated, but incision and drainage should be delayed until the effect of chemotherapy has been observed. Radical excision is inadvisable because of the risk of elephantiasis of the scrotum or of the vulva.

Patients with the acute anorectal syndrome should be treated in the same manner.

Patients with rectal stricture require hospital management.

2. Chemotherapy: The use of sulfanilamide and its derivatives in cases of lymphogranuloma venereum has not yet been established, but there are some clinical indications that they may be of considerable value. If used they should be employed as follows:

(a) Sulfanilamide. Sulfanilamide therapy should consist of the administration of 1.25 Gm. of the drug four times daily for the first four or five days, followed by a reduction to from 0.5 to 0.75 Gm. four times daily for an additional seven days. If inflammatory symptoms (not residual scarring) persist, repeat the chemotherapeutic course after a rest period of ten to fourteen days, utilizing the same agent or one of the allied chemotherapeutic agents.

(b) Sulfapyridine. Sulfapyridine should be administered in doses of 3 Gm. for the first day and 2 Gm. for the following ten to twelve days (in divided doses at four hour intervals). The course should be repeated after a rest period of ten to fourteen days if clinical evidence indicates active extension of the glandular process.

The acute anorectal syndrome should be treated in the same manner as the inguinal manifestations. Stricture or other late complications should receive special consideration.

3. Biologic treatment. Frei antigen given intravenously in 0.2 to 0.3 cc. amounts every second day may be of value. The duration of treatment will depend on the patient's response.

#### GRANULOMA INGUINALE

**A. Definition.**—Granuloma inguinale is a chronic disease due to infection with a Leishmania-like organism. It involves primarily skin and mucous membranes, rarely with coincident adenopathy; it is characterized by vivid-hued, shining, verrucous, vegetating nodules of granulating tissue with a hemorrhagic surface surrounded by a thin, easily excoriated epidermis. The condition spreads by peripheral extension and autoinfection, often involving the entire genital area. It may involve large adjacent areas of the lower part of the abdomen and the thighs. The lesions show little or no tendency to spontaneous healing and may persist for months or years.

**B. Diagnosis.**—The clinical appearance of a chronic process involving the groin and genital areas with little

involvement of the lymph nodes is characteristic of the disease. The finding of Donovan bodies by the Wright stain in deep tissue scrapings or in a biopsy specimen from a peripheral area of diseased tissue (including a section of normal adjacent skin) confirms the diagnosis.

Lymphogranuloma venereum, chancroidal infection and syphilis should be considered in the differential diagnosis, and the appropriate test for each condition should be performed.

**C. Treatment.**—Antimony and potassium tartrate may be administered intravenously in doses of 0.03 to 0.12 Gm. (beginning with 3 cc. and increasing to 12 cc. of a 1 per cent solution, if tolerated), three times a week, the maximum tolerated dose to be given for fifteen doses.

Fuadin 1 to 3 cc., 0.06-0.18 Gm., or anthiomaline 1 to 3 cc., or 0.06-0.18 Gm. (both of these are complex antimony compounds), may be given intramuscularly two to three times weekly for twenty to twenty-five doses when the patient has difficulty in taking antimony and potassium tartrate or when the lesions have not improved satisfactorily with that drug.

Courses of antimony and potassium tartrate, fuadin or anthiomaline should be continued for at least four months after all lesions are completely healed; otherwise relapse is almost certain to occur.

Local treatment of the lesions may be limited to daily dressings, or surgical excision of the entire area may be necessary. Large areas may be treated with solid carbon dioxide pencils.

#### ENCLOSURE TO CIRCULAR LETTER NO. 18

1. The following designations will be used in obtaining drugs recommended in Circular Letter No. 18:

- (a) Items 10800 to 10804—Arsphenamine U. S. P.
- (b) Items 13000 to 13005—Neocarsphenamine U. S. P.
- (c) Item 11063—Bismuth subsalicylate U. S. P., for intramuscular injection (1 cc. = 0.13 Gm. bismuth subsalicylate).
- (d) Item 14635—Sulfanilamide, powder.
- (e) Item 14637—Sulfanilamide, 5 grain tablets.
- (f) Item 14639—Sulfapyridine, 7.7 grain tablets.
- (g) Item 14641—Sulfathiazole, 7.7 grain tablets.
- (h) Item 14891—Tryparsamide U. S. P., 2 Gm. ampules.
- (i) NS-I—Arsenoxide (Mapharsen, Parke, Davis & Co.).
- (j) NS-I—Frei antigen (1 cc. vial—10 tests) Lederle.
- (k) NS-I—Antimony and potassium tartrate 1 per cent in 5 cc. ampules (each ampule contains 0.05 Gm.).
- (l) NS-I—Fuadin (Winthrop).
- (m) NS-I—Anthiomaline (Merck) 16 per cent solution, 1 cc. = 0.01 Gm. antimony (lithium antimony thiomalate).

2. All standard and nonstandard items will be obtained in accordance with existing regulations.

#### ADDITIONAL NURSES NEEDED FOR THE GOVERNMENT

An acute shortage of nurses for Civil Service positions related to the National Defense Program prevails, especially in some parts of the country, the U. S. Civil Service Commission announces. Further information concerning these positions may be had by writing to the U. S. Civil Service Commission, Washington, D. C., or by applying to the Secretary of the Board of U. S. Civil Service Examiners at any first or second class post office.

There has recently been an increased demand for nurses under the U. S. Public Health Service in extracantonment zones and where large defense industries are located. The U. S.

Civil Service Commission announces open continuous examinations to secure nurses. Two examinations are now open for receipt of applications. One, announcement 38, under the title of Public Health Nurse, \$2,000 a year, and Graduate Nurse, \$1,800 a year, is open for the U. S. Public Health Service and the Indian Service, including Alaska. Applicants are not given a written test but are rated on their professional training and experience. The other, announcement 100, under the title of Junior Graduate Nurse, \$1,620 a year, is for the U. S. Public Health Service, the Indian Service and the Veterans' Administration. This examination includes a written test now, but it is expected that it will be reannounced soon as an "unassembled" examination.

## HOSPITAL DETACHMENTS TRANSFERRED TO AIR CORPS ASSIGNMENTS

The War Department has ordered the transfer of a number of Station Hospital Detachments in the Ninth Corps Area to Air Corps Facility assignments in the Northwest. The transfers are permanent and affect the following Medical Detachments: forty-seven enlisted men at Fort Lewis, Wash., set up for Felts Field, Wash., to be transferred in grade to the Air Corps Facility, Boise, Idaho, at the earliest practical date; forty-two enlisted men at Fort Lewis set up for Portland, Ore., to be transferred in grade to the Air Corps Facility, Portland, Ore.; sixty-two enlisted men at McCord Field, Wash., set up for Spokane, Wash., to be transferred in grade to the Air Corps Facility, Fort George Wright, Wash.; forty-one enlisted men at McCord Field set up for Bellingham, Wash., to be transferred in grade to the Air Corps Facility, Everett, Wash., about May 30; the enlisted men of the Medical Detachment, unassigned, at Fort Douglas, Utah, consisting of twenty-nine privates, will be transferred to the Air Corps Facility, Pendleton, Ore., about May 25.

## TEMPORARY PROMOTIONS IN THE ARMY

The War Department has announced that promotions to the grade of general officer, temporary or permanent, are made solely on the basis of selection. Heretofore promotions to grades below that of general officer have been based on seniority or length of service. The War Department does not intend to seek a change at this time in the methods of making permanent promotions; it has reached a decision, however, that future temporary promotions of Regular Army officers to the grade of colonel will be determined on a basis of selection. The system may eventually lead to the extension of the policy of selection for temporary promotion to all grades and in all components during the present emergency.

Consideration is being given by the War Department to the best method of determining those to be promoted. Available for selection will be the lieutenant colonels and majors of the promotion list of the Regular Army. These officers comprise a large group, all of whom have had practically the same

length of service and the majority of whom have had World War experience.

In selecting those to be promoted, great weight will be given to character and leadership. The extensive maneuvers scheduled for this summer and fall will provide an unusual opportunity for officers to demonstrate qualities of leadership under field conditions. Physical and mental vigor will be essential qualities in determining selections for command duty. General efficiency and age will, of course, be considered.

Under existing law permanent promotions to the grade of lieutenant colonel from the rank of major occur on the completion of twenty-three years of service, provided a specified number of those years have been in the grade of major. There are many Regular Army majors with more than twenty-three years' service whose promotion has been delayed pending the completion of the required years of service in the grade of major. Since many lieutenant colonels of the Officers' Reserve Corps on active duty have reached that rank after but eighteen years of service, the limitation imposed on the Regular Army majors is to be canceled in the interest of fairness and efficiency.

A special policy with respect to medical officers and chaplains in field grades will be announced shortly.

Retired officers called to active duty will receive temporary promotions, if recommended by their commanding officers, on the following basis:

Lieutenant colonel to colonel on completion of twenty-eight years of active service.

Major to lieutenant colonel on completion of twenty-three years of active service.

Captain to major on completion of twelve years of active service.

First lieutenant to captain on completion of three years of active service.

Second lieutenant to first lieutenant on completion of one year of active service.

Retired officers of the Medical Corps and chaplains will be advanced, to the next grade, if so recommended, on the completion of twenty-six years of service for the grade of colonel, and varying from twenty to three years of service for the lower grades. Officers securing initial temporary promotions under this policy will not be advanced more than one grade prior to at least a year's additional active duty.

## ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

ALBERT, Arnold, Captain, Washington, D. C., Camp Lee, Va.  
ARONSON, Joseph David, Major, Wayne, Pa., Fort Belvoir, Va.  
BACHMANN, Lawrence Charles, 1st Lieut., Pittsburgh, Camp Lee, Va.  
BERNSTEIN, Joseph, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
BONE, Charles Alfred, Jr., 1st Lieut., Glenside, Pa., Fort Eustis, Va.  
BOYSEN, Theophilus Henry, 1st Lieut., Philadelphia, Camp Davis, N. C.  
BUTLER, Raymond Kenneth, Captain, Madison, Va., Camp Davis, N. C.  
CAPRIOTTI, Octavius Anthony, 1st Lieut., Hatfield, Pa., Fort George G. Meade, Md.  
CARABELLO, Natal Christopher, 1st Lieut., Reading, Pa., Fort George G. Meade, Md.  
CHESLER, William, 1st Lieut., Philadelphia, Fort George G. Meade, Md.  
CUBBERLEY, Charles Lamb, Jr., 1st Lieut., Philadelphia, Camp Davis, N. C.  
FINN, Joseph Lawrence, Captain, Philadelphia, Fort George G. Meade, Md.  
FLEGLER, Saul Milton, 1st Lieut., New Kensington, Pa., Camp Davis, N. C.  
FLEMING, William Herbert, 1st Lieut., Shelocta, Indiana County, Pa., Camp Lee, Va.  
FOSTER, John Van Valzah, 1st Lieut., Harrisburg, Pa., Fort Eustis, Va.  
GLADSTONE, Joseph Edward, 1st Lieut., Exmore, Va., Camp Lee, Va.  
GLASS, Albert Julius, 1st Lieut., Fort George G. Meade, Md.  
GLAUDEL, Stanley Francis, 1st Lieut., Fort George G. Meade, Md.  
GRAHAM, Richard Walter, Jr., 1st Lieut., Fort George G. Meade, Md.  
HORVAT, Arthur Joseph, 1st Lieut., Duryea, Pa., Fort George G. Meade, Md.  
HUBBARD, Charles Crow, 1st Lieut., Uniontown, Pa., Carlisle Barracks, Pa.  
JONES, Clement Russell, Jr., Captain, Dixmont, Pa., Fort Eustis, Va.

JONES, Lawrence Paul, Captain, Emporia, Va., Camp Pendleton, Va.  
KIMMEL, Henry Arden, 1st Lieut., Lewistown, Pa., Fort Belvoir, Va.  
KRAJESKI, Romuald John Francis, 1st Lieut., Wilkes-Barre, Pa., Fort Eustis, Va.  
LAURENT, August Aloysius, 1st Lieut., Avella, Pa., Camp Lee, Va.  
LAWSON, Edward Kirby, Jr., 1st Lieut., Penbrook-Harrisburg, Pa., Camp Lee, Va.  
LINHART, William Oran, Jr., 1st Lieut., Jeanette, Pa., Fort Eustis, Va.  
MAFFUCCI, Victor, Jr., 1st Lieut., Everett, Pa., Camp Lee, Va.  
MCCAFFERTY, John Sidney, 1st Lieut., Freeport, Pa., Indiantown Gap Military Reservation, Pa.  
MCCLAIN, Clifton Andrew, Jr., 1st Lieut., Christiana, Pa., Fort George G. Meade, Md.  
MCFARLAND, Paul Edwards, 1st Lieut., Saxonburg, Pa., Camp Davis, N. C.  
MCLENAHAN, Thomas Morrow, Jr., 1st Lieut., Pittsburgh, Camp Lee, Va.  
MILLER, Cledith Aten, 1st Lieut., Wilkes-Barre, Pa., Camp Lee, Va.  
MILLER, Harry Archer, Captain, Baltimore, Fort Monroe, Va.  
MILLER, Ira Clyde, Captain, Camp Hill, Pa., Fort George G. Meade, Md.  
MITCHELL, Edward Albert, 1st Lieut., Clinchco, Va., Carlisle Barracks, Pa.  
MITCHELL, John Adams, 1st Lieut., Monaca, Pa., Fort George G. Meade, Md.  
MOBILIO, Joseph Anthony, 1st Lieut., Philadelphia, Camp Davis, N. C.  
MOSELEY, Vince, 1st Lieut., Philadelphia, Fort Belvoir, Va.  
MYERS, William, 1st Lieut., Pittsburgh, Camp Pendleton, Va.  
NEILL, John Leitch McVicker, 1st Lieut., Smethport, Pa., Fort Eustis, Va.  
NICASTRO, Gennaro Carlo, 1st Lieut., Philadelphia, Fort George G. Meade, Md.  
PACKER, Bernard Donald, 1st Lieut., Richmond, Va., Fort Belvoir, Va.  
PAINE, Wilmer Howard, 1st Lieut., Charlottesville, Va., Fort Bragg, N. C.  
PARKER, Henry Stoddert, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
PATRICK, Nicholas Emil, 1st Lieut., Scranton, Pa., Fort Eustis, Va.



PEERY, James McGuire, 1st Lieut., North Tazewell, Va., Fort George G. Meade, Md.  
PIERCE, Leslie Staebler, 1st Lieut., Greensburg, Pa., Fort Eustis, Va.  
ROTHERMEL, John Keim, 1st Lieut., Strausstown, Berks County, Pa., Camp Lee, Va.  
SCHENTHAL, Joseph Edwin, 1st Lieut., Baltimore, Fort George G. Meade, Md.  
SCHLAN, Louis, 1st Lieut., Lewisburg, Pa., Camp Davis, N. C.  
SEAWELL, William Asa, 1st Lieut., Raven, Va., Fort George G. Meade, Md.  
SOBEL, Harry, 1st Lieut., Philadelphia, Fort George G. Meade, Md.

### FIFTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fifth Corps Area, which comprises the state of Ohio, West Virginia, Indiana and Kentucky:

BEHM, Alton W., 1st Lieut., Chardon, Ohio, Fort Benjamin Harrison, Ind.  
BERNDT, Albert L., 1st Lieut., Portsmouth, Ohio, Fort Knox, Ky.  
BROWN, David, 1st Lieut., Columbus, Ohio, Fort Benjamin Harrison, Ind.  
BROWN, John Edwin, Jr., 1st Lieut., Columbus, Ohio, Fort Hayes, Ohio.  
CHRENKA, Paul, 1st Lieut., Cleveland, Fort Thomas, Ky.  
CUNNINGHAM, Ralph B., 1st Lieut., Cincinnati, Fort Knox, Ky.  
DEL VECCHIO, James J., 1st Lieut., Rayland, Ohio, Fort Knox, Ky.  
DONLEY, Robert F., 1st Lieut., Columbus, Ohio, Fort Hayes, Ohio.  
GARRETT, Evan L., 1st Lieut., Murray, Ky., Fort Hayes, Ohio.  
GOLD CAMP, John S., 1st Lieut., Youngstown, Ohio, Fort Benjamin Harrison, Ind.  
GROSSMAN, Royal G., Lieut. Col., Lakewood, Ohio, Fort Knox, Ky.  
GROVE, Paul D., 1st Lieut., Cincinnati, Fort Knox, Ky.  
HARTZLER, Adrian J., 1st Lieut., Wooster, Ohio, Fort Knox, Ky.  
HARVEY, Archelaus D., 1st Lieut., Lebanon, Ohio, Fort Hayes, Ohio.

### SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, comprising North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

ALFTINE, David Carl, 1st Lieut., Vinton, Iowa, Corps Area Service Command Reception Center, Fort Snelling, Minn.  
ALLEE, William Sylvanus, 1st Lieut., St. Louis, Corps Area Service Command Replacement Center Infirmary, Fort Leonard Wood, Mo.  
DOUGLAS, Paul Lovell, 1st Lieut., Columbia, Mo., 92d Engineers, Fort Leonard Wood, Mo.  
FRITSCH, Carl John, 1st Lieut., New Ulm, Minn., Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
HARRIS, Donald Macrae, 1st Lieut., Manchester, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
HOFFMAN, Richard Frederick, 1st Lieut., Warren, Ark., 214th General Hospital, Camp J. T. Robinson, Ark.  
LEIGHTON, Robert Sisson, 1st Lieut., Evansville, Minn., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.  
LYNCH, Harry Orange, Captain, Little Rock, Ark., Corps Area Service Command Induction Station, Fort Snelling, Minn.  
MEYER, Wallace Martin, 1st Lieut., Rollingstone, Minn., 30th Field Artillery, Camp Roberts, Calif.  
NEEL, Harry Bryan, 1st Lieut., Albert Lea, Minn., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
NEU, Harold Nicholas, 1st Lieut., Sac City, Iowa, Corps Area Service Command Induction Station, Fort Snelling, Minn.

### EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

BIGLER, Ivan Edward, 1st Lieut., Ada, Okla., Lou Foote Flying Service, Stamford, Texas.  
BUELL, Arthur Louis, 1st Lieut., Vanconver, B. C., 55th Medical Battalion, Fort Sam Houston, Texas.  
CHRISTIAN, Edmund Eugene, 1st Lieut., Pueblo, Colo., Station Hospital, Fort Bliss, Texas.  
COLLINS, William Arthur, Jr., 1st Lieut., El Paso, Texas, Second Division, Fort Sam Houston, Texas.  
DAVIS, Robert Louis, 1st Lieut., Holbrook, Ariz., 112th Cavalry Medical Detachment, Fort Clark, Texas.  
DRYDEN, Sam Hefner, 1st Lieut., Abilene, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.  
DUFF, Kenneth Robert, 1st Lieut., Kansas City, Mo., 55th Medical Battalion, Fort Sam Houston, Texas.  
EPPS, Curtis Howard, 1st Lieut., Duncan, Okla., Station Hospital, Fort Sill, Okla.  
GILL, Earl K., Captain, Corpus Christi, Texas, Station Hospital, Camp Hulen, Texas.  
HAMPTON, Dan E., 1st Lieut., Denver, 55th Medical Battalion, Fort Sam Houston, Texas.  
HARGIS, William Huard, Jr., 1st Lieut., San Antonio, Texas, Station Hospital, Fort Sam Houston, Texas.

SOMERS, Lewis Frank, 1st Lieut., Lynchburg, Va., Fort George G. Meade, Md.  
STILL, Joseph William, 1st Lieut., Greenbelt, Md., Camp Davis, N. C.  
STRONG, Paul Stone, 1st Lieut., Baltimore, Fort Eustis, Va.  
THOMPSON, Joseph Lawn, Jr., 1st Lieut., Washington, D. C., Indian-town Gap Military Reservation, Pa.  
WELSH, John William, 1st Lieut., Leechburg, Pa., Camp Davis, N. C.  
WIDDOWSON, William Work, 1st Lieut., Indiana, Pa., General Dispensary, U. S. Army, Philadelphia.  
YOUNG, Frederick Frick, 1st Lieut., Easton, Pa., Fort George G. Meade, Md.

HELD, George A., Captain, Jasper, Ind., Fort Knox, Ky.  
HULSE, Charles A., 1st Lieut., Cleveland, Fort Thomas, Ky.  
MAPLE, John L., 1st Lieut., Louisville, Ohio, Fort Knox, Ky.  
MELTZER, Harold Jack, 1st Lieut., Cleveland, Fort Benjamin Harrison, Ind.  
MOORE, Randolph P., 1st Lieut., Cleveland, Fort Thomas, Ky.  
MOORE, William A., 1st Lieut., Cincinnati, Fort Benjamin Harrison, Ind.  
OSMOND, John D., Jr., 1st Lieut., Cleveland Heights, Ohio, Fort Knox, Ky.  
PALM, John M., 1st Lieut., Brazil, Ind., Fort Knox, Ky.  
PARK, James H., 1st Lieut., Ashtabula, Ohio, Fort Benjamin Harrison, Ind.  
PIMSNER, Arthur A., 1st Lieut., Lakewood, Ohio, Fort Thomas, Ky.  
SCHILLINGER, Arnold A., 1st Lieut., Chillicothe, Ohio, Fort Knox, Ky.  
SELIGMAN, Bert, 1st Lieut., Toledo, Ohio, Fort Benjamin Harrison, Ind.  
SHILLING, Harry E., 1st Lieut., Troy, Ohio, Fort Knox, Ky.  
SIEGEL, William B., 1st Lieut., Alum Creek, W. Va., Fort Knox, Ky.  
VANDE VELDE, Joseph D., 1st Lieut., Cleveland, Fort Knox, Ky.  
WASILKO, Joseph J., 1st Lieut., Youngstown, Ohio, Fort Knox, Ky.  
WHERLEY, Harold F., 1st Lieut., Coshocton, Ohio, Fort Hayes, Ohio.  
WILLIAMS, Robert E., 1st Lieut., Barborton, Ohio, Fort Knox, Ky.  
YORK, Dillard B., Jr., 1st Lieut., Columbus, Ohio, Fort Hayes, Ohio.

PETERSON, Donald Herbert, 1st Lieut., St. Paul, Corps Area Service Command Induction Station, Fort Des Moines, Iowa.  
PUMPHREY, Loira Cromwell, Major, Keokuk, Iowa, Command and General Staff School, Fort Leavenworth, Kan.  
RAE, Harold Burton, 1st Lieut., Torrington, Wyo., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.  
SACH-ROWITZ, Alvan, Major, Moose Lake, Minn., 40th Field Artillery, Camp Roberts, Calif.  
SENN, Emmett Jacob, 1st Lieut., Herculaneum, Mo., Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
SMILEY, Edward Archibald, 1st Lieut., Junction City, Kan., Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
SMITH, James Omer, 1st Lieut., Clinton, Mo., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.  
SPIRY, Arthur William, 1st Lieut., Moberg, S. D., 217th General Hospital, Fort Riley, Kan.  
STREET, Bernard, 1st Lieut., St. Cloud, Minn., Corps Area Service Command Induction Station, Fort Des Moines, Iowa.  
SUBBY, Walter, 1st Lieut., Hibbing, Minn., Corps Area Service Command Reception Center, Fort Snelling, Minn.  
SULLIVAN, Paul John, 1st Lieut., Rushville, Neb., 85th Field Artillery, Camp Roberts, Calif.  
WATSON, William John, 1st Lieut., Holdingford, Minn., Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
WILKE, Frank Albert, 1st Lieut., Woodward, Iowa, Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
WOLF, William Kenneth, 1st Lieut., Hay Springs, Neb., Corps Area Service Command Reception Center Infirmary, Fort Des Moines, Iowa.

HICKS, Yale, 1st Lieut., San Antonio, Texas, Station Hospital, Fort Sam Houston, Texas.  
LEDBETTER, William Harry, 1st Lieut., Wichita Falls, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.  
MATTS, Robert Marshall, Captain, Yuma, Ariz., 25th Infantry, Fort Huachuca, Ariz.  
NICHOLSON, William D., 1st Lieut., Houston, Texas, Ellington Field, Texas.  
PAUL, Thomas G., 1st Lieut., Syracuse, N. Y., 104th Infantry Battalion (Army Transport), Fort Sam Houston, Texas.  
PAVLETIC, Louis Martin, 1st Lieut., Raton, N. M., 55th Medical Battalion, Fort Sam Houston, Texas.  
REDING, Anthony C., 1st Lieut., Tulsa, Okla., 202d Coast Artillery, Fort Bliss, Texas.  
ROGERS, Albert Mitchell, 1st Lieut., San Antonio, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.  
SALMON, George Wilbur, 1st Lieut., St. Louis, 55th Medical Battalion, Fort Sam Houston, Texas.  
SELLERS, Fred William, 1st Lieut., Dallas, Texas, Ellington Field, Texas.  
SMITH, William Carleton, 1st Lieut., Houston, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.  
WHITE, Toler R., Major, Kingman, Ariz., S. S. Service System, Santa Fe, N. M.  
WILSON, Francis W., 1st Lieut., San Antonio, Texas, 55th Medical Battalion, Fort Sam Houston, Texas.  
WOLFE, Alfred S., 1st Lieut., Houston, Texas, Ellington Field, Texas.  
YEARY, Edwin Curtis, 1st Lieut., St. Paul, 55th Medical Battalion, Fort Sam Houston, Texas.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### THEODORE G. KLUMPP APPOINTED DIRECTOR DIVISION OF FOODS, DRUGS AND PHYSICAL THER- APY OF AMERICAN MEDICAL ASSOCIATION

Following the untimely death of Dr. Paul Nicholas Leech, who had served for many years as Secretary of the Council on Pharmacy and Chemistry, Director of the Chemical Laboratory and Director of the Division of Foods, Drugs and Physical Therapy of the American Medical Association, the Board of Trustees gave careful consideration to the problem of securing a successor. The importance of this position in relationship to the demands made on its incumbent for judicial decisions, leadership and the assumption of responsibility are so great that but few of the many persons considered seemed to fill the requirements. Now the Board of Trustees announces the appointment to this position of Dr. Theodore G. Klumpp, at present chief of the Drug Division of the Food and Drug Administration of the United States Government.

Dr. Klumpp graduated with the degree of bachelor of science from Princeton University in 1924, magna cum laude; in 1928 he received the degree of doctor of medicine from Harvard Medical School; in 1939 he was made a fellow of the American College of Physicians. Following graduation in medicine he did research and investigative work in the Children's Hospital in Boston for one year. He served as intern in the Peter Bent Brigham Hospital for one year and as assistant resident physician in Lakeside Hospital, Cleveland, from 1930 to 1932. Then he accepted the appointment as instructor in internal medicine at Yale University Medical School, associate physician in the New Haven Hospital, chief of the Hematology Clinic and director of the Medical Laboratories in the New Haven Hospital, holding these positions from 1933 to 1936. At the same

time he was associate examiner of the National Board of Medical Examiners and secretary of Yale Medical Society. From 1936 to 1937 he was assistant clinical professor of internal medicine in Yale University. At this time also he accepted the appointment as medical officer of the Food and Drug Administration in the United States Department of Agriculture, becoming chief medical officer and then chief of the Drug Division in the Food and Drug Administration, which is now a part of the Federal Security Administration.

In recent years Dr. Klumpp has kept in touch with medical science by serving as adjunct clinical professor of medicine in George Washington University School of Medicine and attending physician in the Gallinger Municipal Hospital of Washington, D. C. He holds membership in many important organizations, including the American Society for Clinical Investigation, the American Association for the Advancement of Science, the American College of Physicians and Sigma Xi. The bibliography of his writings begins in 1928 and includes more than twenty-five contributions on various aspects of research and administration in public health.

Dr. Klumpp will assume his position with the American Medical Association on July 1.

### RADIO BROADCASTS

The last two programs to be broadcast in the series "Doctors at Work" are:

May 28. The Doctor as a Citizen.  
June 4. A. M. A. Convention.

The program is scheduled over the Blue network of the National Broadcasting Company Wednesday at 10:30 p. m. eastern daylight saving (9:30 eastern standard) time (9:30 Chicago daylight saving, 8:30 central standard, 7:30 mountain standard, 6:30 Pacific standard time).

## MEDICAL LEGISLATION

### STATE MEDICAL LEGISLATION Florida

*Bills Introduced.*—S. 343 and Committee Substitute for H. 274 propose to require every physician, midwife or other person in attendance at the birth of a child to instil or have instilled in the eyes of the baby within one hour after birth a 1 per cent fresh solution of silver nitrate or other effective prophylactic approved by the state board of health. S. 416 and H. 923, to amend the osteopathic practice act, propose, among other things, to require licensed osteopaths to renew their licenses annually and at that time to pay a renewal fee of \$5 to the osteopathic board. After Jan. 1, 1942 the right of a licensee to a renewal of his license will be conditioned also on his attendance in the preceding year at the two days educational program as promulgated and conducted by the state osteopathic association. S. 497 and H. 1030 propose a method by which all counties of the state may establish and maintain public hospitals and levy a special tax and issue bonds for the construction and maintenance of such hospitals. Whenever one hundred or more resident freeholders of any county petition the board of county commissioners to do so, the commissioners shall submit the question of establishing and operating a hospital and levying a special tax therefore to the qualified electors of the county. H. 916 proposes to enact a separate massage practice act and to create an independent board of massage to examine and license applicants for licenses to practice massage. The bill states "That

the practice of massage is hereby declared a profession, and for the purpose of this Act is hereby defined as follows, viz.: The scientific manual manipulation of the tissue and muscle of the human body, together with the skilful use of scientific apparatus usually associated with the practice of massage in administering such treatments as cabinet baths, turkish baths, reducing treatments, fomentations, natural and artificial heliotherapy, vibratory treatments and colonic-irrigations." H. 978, to amend the state Food, Drug and Cosmetic Act, proposes, among other things, that a drug shall be deemed to be misbranded if it contains any quantity of the following drugs or any quantity of their derivatives and preparations: "aminopyrine, barbituric acid, cinchophen, dinitrophenol, sulfanilamide, carbromal (Bromdiethyl-acetyl-carbamide), chloral, chloral hydrate, chlorbutanol, paraldehyde, sulfonal (Sulfonmethane), tetronal (Diethyl-sulfon-diethyl-methane) or trional (sulfon-ethylmethane); unless it is sold on a written prescription signed by a member of the medical, dental or veterinary profession who is licensed by law to administer such drug, and its label bears the name and place of business of the seller, and serial number and date of such prescription, and the name of such member of the medical, dental or veterinary profession." H. 1012 proposes to make it unlawful for any person except a licensed wholesale druggist, a registered pharmacist or a licensed physician to sell or distribute any amytal, luminal, veronal, barbitol, acid diethylbarbituric or any of its salts, derivatives or compounds of the foregoing substances. The persons

who are authorized to sell or distribute these drugs must record the name and address of the purchaser, the amount sold and the date of sale. The bill also proposes to create a state board of drug examiners to be composed of the members of the board of pharmacy, the state chemist and the director of the state college of pharmacy, which is to be empowered to determine from time to time such additional drugs as are dangerous and poisonous and is to be vested with the power to place the additional drugs "under the restriction as herein set forth." H. 1023 proposes to condition the issue of a license to marry on the presentation by each party to the proposed marriage of a physician's certificate that the party is not epileptic, insane or feeble-minded, is free of pulmonary tuberculosis in a communicable stage, and a smear and specimen of blood from the party has been submitted to the Florida State Board of Health, which has advised the physician that the party is free from any communicable venereal disease. H. 1046 proposes to authorize the Board of County Commissioners of Leon County to assess a special tax annually, not to exceed 3 mills on the dollar on all real and personal property taxable, to create a fund for the medical and hospital treatment of the poor of the county.

#### Massachusetts

*Bill Introduced.*—H. 2445, which reported on H. 869, proposes that if any physician is informed that a patient has been involved in an accident and that the injuries subject to treatment are the results of the accident the physician, if he has been employed by or has rendered services to any insurance company within one year next prior to the first treatment of the injuries, shall inform the patient in writing to that effect and shall furnish him with the names of the insurance companies in question.

#### Nebraska

*Bill Introduced.*—Bill 513 proposes that a license to practice osteopathy shall confer on the holder "the right to practice osteopathy in all its branches, including operative surgery with instruments, as taught in the osteopathic colleges recognized by the American Osteopathic Association."

#### South Carolina

*Bill Introduced.*—H. 817 proposes that hereafter all domestic servants who present themselves for employment shall furnish their employer with a certificate from a practicing physician or from a public health officer that they have been examined within two weeks prior to the time of the presentation of the certificate and that they are free from all contagious, infectious and communicable diseases. The certificate also must show "the nonexistence of any venereal disease which might be transmitted." The bill proposes that all domestic servants must

be examined at least once a year and must present to the employer following the examination a certificate similar to the one just referred to.

### MEDICAL BILLS IN CONGRESS

*Changes in Status.*—H. R. 2475 and S. 860 have been reported to the Senate, without amendment, with recommendation that they pass. The former proposes to prohibit prostitution within such reasonable distance of military or naval establishments as the Secretaries of War or Navy shall determine to be needful to the efficiency, health and welfare of the Army and Navy. The latter, in addition to providing for the suppression of vice in the vicinity of military camps and naval establishments, also proscribes the sale of alcoholic liquors at or within any military camp, station, fort, post, yard, base, cantonment, training or mobilization place which is used at the time for military purposes.

*Bills Introduced.*—S. 1485, introduced by Senator Bailey, North Carolina, proposes to amend the sections of the Social Security Act relating to aid to the blind by providing, among other things, that the term "aid to the blind" shall include the furnishing of rehabilitation and other services to the blind and the furnishing of services for the restoration and conservation of vision. S. 1504, introduced by Senator Langer, North Dakota, proposes to amend the Selective Training and Service Act of 1940 by providing for the deferment of students until the end of the academic year during which they are selected for training and service. H. R. 4688, introduced by Representative Marcantonio, New York, proposes a nationwide system of social security. This bill, among other things, provides for an annual expenditure of not less than \$400,000,000 for the construction of hospitals, health centers, clinics, laboratories and other institutional facilities and a similar amount for public health services, including maternal and child health services, prevention and control of disease, dental care and other related medical and health services. H. R. 4737, introduced by Representative Voorhis, California, proposes to authorize the Administrator of Veterans' Affairs to issue regulations providing for more liberal policies in determining the service connection of disabilities of veterans. H. R. 4755, introduced by Representative Randolph, West Virginia, proposes to amend the act relating to the operation of stands in federal buildings by blind persons. The term "blind person" is redefined to mean a person having not more than 20/200 of visual acuity in the better eye with correcting lenses; or visual acuity greater than 20/200 but with a limitation in the fields of vision such that the widest diameter of the visual field subtends an angle no greater than twenty degrees.

## WOMAN'S AUXILIARY

#### Arkansas

Dr. Preston Hunt, president, State Medical Association of Texas, recently addressed the auxiliary to the Bowie and Miller County Medical Society on "How the Auxiliary Serves the Medical Association."

Dr. Thomas P. Faltz, speaker at a meeting of the auxiliary to the Sebastian County Medical Society, February 10, outlined plans for a Negro hospital and explained how the auxiliary may assist the medical society in furnishing the hospital.

#### Florida

The meeting of the auxiliary to the Duval County Medical Society, January 9, at the home of Mrs. Gordon H. Ira, Jacksonville, was addressed by Dr. William H. McCullagh on "The Psychosis of Hitler."

#### Iowa

The organization committee, under the leadership of Mrs. W. R. Hornaday, announced the formation of an auxiliary in Hardin County. Officers of the new auxiliary are Mrs. Grace Potter Miller of Ackley, president; Mrs. R. R. Gaard of Radcliffe, vice president; Mrs. F. W. Haulihan of Ackley, secretary, and Mrs. J. W. Caldwell of Steamboat Rock, treasurer.

#### Oklahoma

At the February meeting of the Le Flore County auxiliary held at the home of Mrs. R. W. Minor in Spiro, Mrs. Earl Woodson read a paper on "Feeding the Army." Mrs. J. J. Hardy told of some scientific discoveries in 1940.

The Oklahoma County auxiliary met at the Y. W. C. A. in Oklahoma City in February. A first aid unit was organized among the members. Thirty members brought garments for the layette shower sponsored by the auxiliary and the other members donated money toward the layettes.

At the February meeting of the Pittsburg County auxiliary, which was held at the home of Mrs. Walter J. Dell, members sewed on layettes for the Red Cross.

#### West Virginia

The auxiliary to the Cabell County Medical Society met in January at the home of Mrs. C. P. S. Ford in Huntington. Prof. Walter Dove, of Marshall College, Huntington, spoke on his travels in Peru. Mrs. J. L. Hutchinson addressed the group on "Strange Bathing Customs in Different Countries." In February at a tea at the home of Mrs. Oscar Biern, plans were made to help with a carnival to aid Britain. The annual Doctor's Day Luncheon was held March 10.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### CALIFORNIA

**Clinical Conference.**—A clinical conference was held in San Bernardino, April 1, for the medical societies of San Bernardino, Riverside and Orange counties. Dr. Carl F. Rusche discussed "Blood in the Urine: Origin and Procedure in Diagnosis"; Dr. Isaac Y. Olch, "Tumors and Inflammation of the Breast," and Dr. Alfred E. Gallant conducted a fracture clinic with special reference to femur and long bone fractures. All are of Los Angeles.

**Medicolegal Dinner.**—The fifth annual joint dinner of the Alameda County Medical Association and the Alameda County Bar Association was held at the Hotel Oakland, Oakland, April 15. Several past presidents of the state medical association were present and also judges of the appellate, superior and justice courts. Dr. Clarence A. DePuy, Oakland, a past president of the county medical association, was chairman of the committee for physicians, and Mr. Edwin Heafey, a past president of the county bar association, chairman of the committee for the lawyers. Entertainment included ten acts of vaudeville.

**Refresher Courses.**—Postgraduate work will be given in a series of refresher courses at the University of California Medical School, San Francisco, in June. The program will include courses by the division of medicine in the fields of heart disease, diseases of the blood and of the gastrointestinal tract and endocrine disturbances. The division of surgery will offer courses having to do largely with traumatic surgery, including a fracture course and the treatment of infections and hand injuries. The division of obstetrics and gynecology will summarize the most recent advances in the care of childbirth and the diseases of women.

### CONNECTICUT

**Warren Prize Awarded to Yale Faculty Members.**—The Warren Prize for 1940 has been awarded to Drs. Hebbel E. Hoff and Louis H. Nahum, associate professor of physiology and research associate in physiology, respectively, Yale University School of Medicine, New Haven, for a paper on the mechanism of the electrocardiograph. The award of \$500 is presented "for the best dissertation, considered worthy of a premium, on some subject in physiology, surgery, or pathological anatomy." It was established in 1870 as the Warren Triennial Prize by Dr. J. Mason Warren in memory of his father, Dr. John C. Warren, the eminent Boston surgeon, who died in 1856. Dr. Warren's will provided that the accumulated interest of the fund shall be awarded every three years. Dr. Hoff graduated at Harvard Medical School, Boston, in 1936 and Dr. Nahum at Yale in 1916. This is the first time the Warren prize has been awarded in Connecticut.

### DISTRICT OF COLUMBIA

**Twenty-Five Year Teachers Honored.**—The General Alumni Association of George Washington University honored nineteen teachers who have served twenty-five years or more on the faculty of the university at a luncheon at the National Press Club, April 5. Dr. Robert H. Harmon, president of the alumni association, presided, and Henry Grattan Doyle, A.M., dean of Columbian College, the senior college of the university, delivered an address on "Wholehearted Inter-Americanism." Included in the group honored were the following members of the medical school staff:

- Dr. Daniel L. Borden, associate professor of surgery.
- Dr. Cline N. Chipman, associate in anesthesia.
- Dr. Coursen B. Conklin, clinical professor of medicine.
- Dr. Harry H. Donnelly, professor of pediatrics.
- Dr. Frank A. Hornaday, assistant professor of medicine.
- Dr. Howard F. Kane, professor of obstetrics and gynecology.
- Dr. Harry H. Kerr, clinical professor of surgery.
- Dr. William B. Marbury, clinical professor of surgery.
- Richard K. Thompson, D.D.S., associate in dental surgery.
- Dr. Elijah W. Titus, clinical professor of obstetrics and gynecology.
- Dr. Charles Stanley White, professor of surgery.

### ILLINOIS

**Postgraduate Course in Venereal Disease.**—The state department of health, cooperating with the U. S. Public Health Service and the Chicago Department of Health, conducted a postgraduate course in venereal diseases at the Municipal Social Hygiene Clinic, 27 East Twenty-Sixth Street, Chicago, April 14-May 3. Class sessions covered practical work in the diagnosis, reporting, treatment and clinical management of the venereal diseases as well as nutritional studies, laboratory demonstrations and methods of educating patients. Three weekly courses were included in the period with no charge to physicians licensed in Illinois.

**Benevolent Fund for Physicians and Their Widows.**—Through action of the council of the Illinois State Medical Society at its 1940 annual session a benevolent fund has been created for indigent physicians and their widows. Members of the committee on medical benevolence, created by the council, are Drs. John S. Nagel, Chicago, chairman; Charles H. Hulick, Shelbyville, and Clarence H. Boswell, Rockford. It was decided to allocate \$1 each year from dues of each member to the fund and to accept gratuities, endowments and the like for this end. Donations from the woman's auxiliary of the state society, raised through their various activities, will also be used for the benevolent fund. It was agreed that monthly benefits not to exceed from \$25 to \$30 would be appropriated for any case found, on investigation, to be worthy of aid.

### Chicago

**Loyola Alumni Clinics.**—A series of clinics has been arranged by the members of the faculty of Loyola University School of Medicine for alumni, June 9-10. The series covers the specialties in medicine and will be conducted at Mercy Hospital.

**Survey of Noise Measurement.**—Plans have been announced for a noise measurement survey of Chicago and suburbs, according to a release from the Chicago Noise Reduction Council, May 2. Results of the survey will be classified into the sources of preventable noises in and about the city and will form the basis of the recently formed council's program of cooperative effort to reduce or eliminate preventable and unnecessary noises. Residents of Chicago and its suburbs are being asked to fill out a questionnaire listing noise nuisances in an attempt by the council to determine what noises are most annoying to people who live and work in this area. The following sources of noise appear on the questionnaire: automobile horns; loud speakers in homes and outside stores; trucks, busses (noisy mechanism or tires), automobile exhaust (or cutouts), noisy brakes on automobiles, riveting, pneumatic drills on streets and excavations, airplanes, noisy parties, locomotive whistles and bells, boat whistles, elevated trains, street cars, ash and garbage collection, newsboys' cries, traffic whistles, fire department sirens and trucks, milkmen, factories and offices. The Chicago Noise Reduction Council announces that application has been made to the secretary of state for a nonprofit organization charter.

**Dean Cutter to Retire from Northwestern.**—Dr. Irving Cutter will retire as dean of Northwestern University Medical School as of September 1, having reached the retirement age. He will continue his association with the medical school as dean emeritus and professor emeritus of medicine. He will also continue as health editor of the Chicago Tribune and superintendent of Passavant Memorial Hospital. He will be succeeded as dean by Dr. James R. Miller, associate professor of medicine and for eight years assistant to Dr. Cutter. Born in Keene, N. H., in 1875, Dr. Cutter graduated at the University of Nebraska College of Medicine, Omaha, in 1910. Jefferson Medical College, Philadelphia, conferred the degree of doctor of laws on him in 1931. He served as instructor in physiologic chemistry at Nebraska from 1910 to 1913; professor of biochemistry and director of the laboratory, 1913 to 1915, and as dean of the medical school from 1915 to 1925, when he became associate professor of medicine and dean at Northwestern. He has been medical director of Passavant since 1928. He has served as editor of the *Nebraska State Medical Journal*, a member of the editorial board of *Annals of Medical History* and as health editor of the *Tribune* since 1935. He was a captain in the medical corps of the U. S. Army, 1917-1918, and a lieutenant colonel in the medical section of the Officers Reserve Corps, 1920-1929. Dr. Miller was born in Murray, Utah, in 1905. He graduated at Northwestern University Medical School in 1930, becoming a member of the staff in 1934.

## INDIANA

**Medical Society Approves Smoke Abatement Work.**—The Allen County Medical Society approved a resolution to support the smoke abatement campaign now in progress in Fort Wayne, newspapers reported, April 16. A committee named to aid in the smoke abatement program includes Drs. Karl C. Eberly, Eugene L. Bulson, William F. Gessler, Ernest R. Carlo, Harry V. Scott, Arthur N. Ferguson and Harvey L. Murdock.

**Society News.**—A symposium on the menopause will constitute the program of the Indianapolis Medical Society, May 27, with Drs. Isadore J. Kwitny, David A. Boyd Jr. and Maurice V. Kahler as the speakers. A quiz program on roentgenology was to be presented before a joint meeting of the Indianapolis and Seventh District medical societies, May 20.—Dr. George K. Fenn, Chicago, discussed "Peripheral Vascular Disease" before the Jasper-Newton and the Iroquois county medical societies in Kentland, April 22.—Dr. Edward C. Rosenow, Rochester, Minn., presented a report on poliomyelitis in the Fort Wayne area during the 1940 epidemic at a meeting of the Fort Wayne Medical Society, April 22.—Dr. Harry E. Mock, Chicago, discussed surgical and traumatic injuries before the Tippecanoe County Medical Society in Lafayette, May 13.

## MARYLAND

**The Thayer Lectures.**—Dr. Joseph T. Wearn, professor of medicine, Western Reserve University School of Medicine, Cleveland, presented two addresses under the William Sydney Thayer and Susan Read Thayer Lectureship in Clinical Medicine at Johns Hopkins University School of Medicine, Baltimore, recently. His lectures were entitled "Observations on the Morphology and Functions of Some of the Components of the Coronary Circuit" and "Alterations in the Heart Accompanying Growth and Hypertrophy."

**Physician Honored.**—The Maryland Academy of Medical and Surgical Sciences devoted its meeting in Baltimore, March 18, to honoring Dr. Arthur G. Barrett, the society's president for the past twenty-two years. He was presented with a silver coffee service. The academy was founded in 1908 as a professional club for doctors of West Baltimore. In 1918, when Dr. Barrett was first elected president, the academy's name was changed to the West Baltimore Medical Society. In 1930, after its membership had been expanded to include other sections of the state, the name was again changed to the Maryland Academy of Medical and Surgical Sciences. At the recent meeting Dr. Barrett was elected president for the twenty-third time.

## MASSACHUSETTS

**District Meetings.**—The Suffolk District Medical Society held its annual meeting at the Boston Medical Library, April 30. Dr. Robert M. Green presented a "Short History of Eclampsia" and Drs. Burton E. Hamilton, Arthur T. Hertig, Maurice B. Strauss, George van S. Smith, Duncan E. Reid, George C. Prather and Raymond S. Titus conducted a symposium on preeclamptic toxemia and eclampsia.—Dr. Harold G. Giddings, Boston, delivered the annual oration before the Middlesex South District Medical Society at its annual session in Cambridge, May 14; he discussed "Middlesex South and Massachusetts Medicine."—The Hampden District Medical Society was addressed at its annual meeting in Springfield, April 29, by Dr. Harold Edward MacMahon, Boston, on "Clinical and Morphologic Findings in Bright's Disease."—The Worcester North District Medical Society was addressed at its eighty-second annual meeting in Fitchburg, April 23, by Drs. Thomas J. Anglem, Boston, on "Treatment of General Peritonitis"; John W. Strieder, Boston, "Carcinoma of the Lung"; Edwin T. Wyman, Boston, "Recent Advances in Infant Feeding and Therapy," and Joseph W. O'Connor, Worcester, "Indications for Cesarean Section."

## MINNESOTA

**The Lyon Memorial Lectures.**—Dr. Ernst Gellhorn, professor of physiology, University of Illinois College of Medicine, Chicago, delivered the second annual Elias Potter Lyon Memorial Lectures in the Physiological Sciences at the University of Minnesota Medical School, Minneapolis, May 1-2. His subjects were "The Neurophysiological Basis of Some General Adjustment Reactions" and "Investigations on the Central Excitation of the Autonomic Nervous System and Their Significance for the Problem of Schizophrenia."

**Community Welfare Planning.**—A plan has been announced in Minneapolis whereby representatives of various organizations will serve as volunteers to improve local welfare services. The project is aimed to increase coordination of the services of one hundred and thirty public and private welfare organizations in Minneapolis through a program of research and planning. The *Bulletin* of the Hennepin County Medical Society states that three divisions are being formed, each supervised by an executive committee of five persons under the direction of a volunteer chairman and embracing three major divisions of social service, covering ease work and relief, health and medical care and group work and recreation. Dr. Edgar J. Huenekens and Mr. James H. Baker, executive secretary, have been named to represent the Hennepin County Medical Society in the division on health and medical care.

## NEBRASKA

**State Tuberculosis Meeting.**—The annual meeting of the Nebraska Tuberculosis Association was held in Kearney, May 23. At a medical session Dr. Lewis J. Moorman, Oklahoma City, was the guest speaker in a discussion on treatment. Other speakers were Drs. John F. Allen, Omaha, on "Fundamentals of the Tuberculosis Problem"; Ronald W. Thompson, Kearney, "Symptomatology of Tuberculosis as Correlated with Laboratory Findings"; Leland C. Albertson, Kearney, "Collapse Therapy"; Joseph A. Weinberg, Omaha, "Thoracoplasty" and Mrs. Florence Zulauf, field worker for the state tuberculosis hospital, Kearney, on follow-up work. Dr. Moorman and Dr. Arthur L. Miller, state health director, Lincoln, were the speakers at the annual banquet.

**District Meetings.**—Dr. Wallace E. Herrell, Rochester, Minn., was the guest speaker at a joint meeting of the Ninth and Tenth Councilor Districts of the Nebraska State Medical Association in Holdrege, April 10. His subject was "Chemotherapy of the Sulfonamide Groups."—Speakers at a meeting of the sixth councilor district in Osceola, April 14, were Drs. Charles W. McLaughlin Jr., Omaha, on "Recent Advances in Nutrition of Surgical Patients" and Frank Lowell Dunn, Omaha, "Modern Undernutrition."—The Third Councilor District met recently in Falls City, with the following speakers, among others: Drs. John F. Gardiner, Omaha, on "The Role of the Adrenal Glands in Health and Disease"; Charles L. Husted, Falls City, "Reduction of Fractures" and Arthur L. Miller, Lincoln, state director of health, "The Work of the State Department of Health." Dr. Roy H. Whitham, Lincoln, director of the state program of the National Youth Administration, gave a discussion of that project.

## NEW JERSEY

**Society News.**—A symposium on anesthesia was presented at a meeting of the Hudson County Medical Society, Jersey City, May 6, by Drs. Alexander W. T. Povalski, John J. Muccia, William J. Gleeson and Abram P. Blakey, Jersey City, and John J. O'Shea, Weehawken.—Thomas F. Anderson, Ph.D., of the R. C. A. laboratories, Camden, addressed the Camden County Medical Society, Camden, May 6, on "The Electron Microscope as It Will Relate to Medicine."—Dr. Irving S. Wright, New York, addressed the section on medicine and pediatrics of the Academy of Medicine of Northern New Jersey, May 13, on "A Critical Evaluation of the Diagnosis and Treatment of Peripheral Vascular Diseases."

## NEW YORK

**State Medical Election.**—Dr. George W. Cottis, Jamestown, was named president-elect of the Medical Society of the State of New York at the annual meeting in Buffalo, April 28 to May 1. Dr. Samuel J. Kopetzky, New York, was installed as president. Other officers elected were Drs. William A. Krieger, Poughkeepsie, second vice president, and Dr. Peter Irving, New York, secretary, reelected.

**Tuberculosis in Industry.**—The Trudeau School of Tuberculosis will sponsor a symposium on tuberculosis in industry, June 9-14, at the Saranac Laboratory for the Study of Tuberculosis, Saranac Lake. Subjects of the sessions will be the disease tuberculosis; incidence of tuberculosis in industrial groups; predisposing factors theoretically significant; incidence and causation of tuberculosis in various industries; methods of control. Among the speakers will be Drs. Leroy U. Gardner, Saranac Lake; Leslie L. Lumsden, U. S. Public Health Service; Elston L. Belknap, Milwaukee; Joseph A. Johnston, Detroit; Adolph G. Kammer, East Chicago, Ind.; Alton S. Pope, Boston; Anna M. Baetjer, Se.D., Baltimore, and Louis I. Dublin, Ph.D., New York.



## New York City

**The Herter Lectures.**—Michael Heidelberger, Ph.D., associate professor of biochemistry, College of Physicians and Surgeons, Columbia University, delivered the Christian A. Herter Lectures at New York University College of Medicine, April 22 and 23. The lectures were on "Immunochemistry."

**Cancer Symposium.**—Mount Sinai Hospital and the New York City Cancer Committee sponsored a cancer symposium, April 25, with the following speakers, among others: Drs. Samuel H. Geist on "Silent Carcinoma of the Cervix Complicating Incomplete Abortion"; Rudolph Kramer, "Resection of Larynx and Upper Esophagus for Postcricoid Carcinoma"; Paul Klenperer, "Relationship of Polypi to Carcinoma of the Colon"; Abraham Hyman, "Nephrectomy for Carcinoma of the Kidney with Removal of Tumor Thrombus from the Inferior Vena Cava," and Israel S. Wechsler, "Abdominal Syndrome as First Manifestation of Tumor of the Brain."

**City to Build Cancer Hospital.**—Announcement was made recently by Mayor La Guardia that the city will build a hospital for cancer patients as a cooperative project of the department of hospitals and Columbia University College of Physicians and Surgeons. The new institution, which the mayor has named the Nightingale Hospital, will cost about \$2,650,000 and will take the place of the old Cancer Institute on Welfare Island and the cancer clinic at 129 East Fifty-Ninth Street. Both the old buildings will be demolished. The new building will have a capacity of three hundred and fifteen beds, with about 20 per cent of the space devoted to research laboratories. It will be staffed jointly by the city and the medical school. Construction and maintenance costs will be borne by the city. It is expected that the hospital will be ready for service late in 1942 or early in 1943.

## OREGON

**Society News.**—Dr. Kendall Emerson, New York, recently addressed a special meeting of the Multnomah County Medical Society, Portland, on "The Chemotherapeutic Approach to Tuberculosis." Dr. John H. Stokes, Philadelphia, addressed another special meeting, April 10, on syphilis.

**State Board Election.**—Dr. Frank E. Fowler, Astoria, was elected president of the state board of medical examiners at its April meeting, succeeding Dr. Irvin R. Fox, Eugene. Dr. Linford S. Besson, Portland, was reelected secretary-treasurer.

## PENNSYLVANIA

**Society News.**—Dr. Floyd H. Bragdon, Pittsburgh, addressed the Fayette County Medical Society, Uniontown, May 1, on "Treatment of Head and Back Injuries."—Dr. Walter E. Dandy, Baltimore, addressed the Cambria County Medical Society, Johnstown, May 8, on "Diagnosis and Treatment of Brain Tumors."—Dr. Edward S. Stafford, Baltimore, addressed the Dauphin County Medical Society, Harrisburg, May 6, on appendicitis.—Dr. Charles R. Austrian, Baltimore, addressed the Harrisburg Academy of Medicine, May 20, on "Diagnosis and Treatment of Some Chronic Diseases of the Lungs."—Philadelphia physicians presented the program of the Washington County Medical Society, Washington, May 14, as follows: Drs. Donald M. Pillsbury, "Superficial Pyogenic and Fungus Infections of the Skin and Their Treatment"; Kendall A. Elsom, "Treatment of Idiopathic Ulcerative Colitis"; Lewis Kraeer Ferguson, "Modern Methods in Office Surgery," and Louis H. Twyeffort, "Emotional Factors in the Etiology and Treatment of Medical Conditions."

## Philadelphia

**First McCrae Award.**—Drs. Robert F. Norris and Alexander Rush received the first annual Thomas McCrae Award of \$100, which is to be granted annually to younger members of the medical staff of the Pennsylvania Hospital. The award, which honored Drs. Norris and Rush for the best publication of work done during 1940, was made at a special meeting April 22 at which Dr. Henry A. Christian, Hersey professor of the theory and practice of physic, emeritus, Harvard Medical School, Boston, made an address on "Scholarship in Medicine." The award was established in memory of the late Dr. Thomas McCrae, professor of practice of medicine and clinical medicine at Jefferson Medical College and chief of one of the medical services at the Pennsylvania Hospital. The subject of the prize winning paper was "A Comparison of the Prothrombin Levels of Maternal and Cord Blood at Delivery." Dr. Rush is now doing postgraduate work in Chicago.

## Pittsburgh

**Annual Mellon Lecture.**—Dr. Carl V. Weller, professor of pathology, University of Michigan Medical School, Ann Arbor, delivered the twenty-fourth annual Mellon Lecture sponsored by the Society for Biological Research of the University of Pittsburgh, May 8. Dr. Weller's subject was "The Inheritance of Retinoblastoma and Its Relationship to Practical Eugenics."

**Society News.**—Speakers before the Allegheny County Medical Society, April 15, were Drs. Wilton H. Robinson on "Sense and Nonsense in the Treatment of Fractures"; Melvin Knoepp, "Recent Improvement in Pneumonia Mortality in Hospital Treatment"; John N. Frederick, "The Physician's Role in the Production of Neuroses," and Rutherford H. Ferguson, "An Evaluation of X-Ray Findings in Gallbladder Diagnosis."—Dr. Charles Anderson Aldrich, Winnetka, Ill., addressed the Pittsburgh Pediatric Society, April 18, on "Ancient Processes in the Scientific Age—Feeding Aspects."—Dr. Alfred W. Adson, Rochester, Minn., addressed the Pittsburgh Otological Society, April 23, on "Treatment of Cerebrospinal Rhinorrhea by Plastic Closure of the Craniosinus Fistula."

## RHODE ISLAND

**Society News.**—Dr. Philip D. Wilson, New York, addressed the Providence Medical Association, April 7, on "Medical and Surgical Work in Great Britain." Dr. Frank B. Cutts and Donald B. Lindsley, Ph.D., Providence, addressed the association, May 5, on "Diagnosis of Cardiac Infarction with Particular Reference to the Precordial Electrocardiogram" and "The Electroencephalogram and Its Clinical Application" respectively.—George L. Salisbury, D.V.M., Wickford, was recently elected president of the Rhode Island Public Health Association.

**Bradley Home Ten Years Old.**—The Emma Pendleton Bradley Home, East Providence, celebrated the tenth anniversary of its opening to patients, April 8. The hospital held open house to the public and in the evening presented a medical program with Drs. Earl D. Bond, professor of psychiatry, University of Pennsylvania School of Medicine, Philadelphia, and Rustin McIntosh, Carpenter professor of pediatrics, Columbia University College of Physicians and Surgeons, New York, as the speakers. The Bradley Home is devoted to study and treatment of children with neurologic and behavior disorders. Approximately 600 patients have been treated in the ten years. In addition, the hospital has maintained a postgraduate training program for physicians and nurses and a program of scientific research. It was founded with an endowment left by the late Mr. and Mrs. George E. Bradley, Providence.

## HAWAII

**Plague.**—Rats proved positive for plague have been found in Hawaii Territory as follows: 1 rat on February 4 and another on February 5, both at Kalopa Homesteads, Paaulau area, Hamakua District, Island of Hawaii; 1 rat on February 11 and another on February 18, both found about 8½ miles from Kahului, Island of Maui.

**Postgraduate Lectures.**—Dr. Marion A. Blankenhorn, Gordon and Helen Hughes Taylor professor of medicine, University of Cincinnati College of Medicine, Cincinnati, gave a course of postgraduate lectures on internal medicine before the Honolulu County Medical Society late in April and early in May. His subjects included pneumonia, nutrition, hypertension, gastroenteric bleeding and medical shock. He was also to be the guest speaker at the annual meeting of the Hawaii Territorial Medical Association May 2-4.

## PUERTO RICO

**Society News.**—Dr. Ramon M. Suarez, San Juan, addressed the Humaçao District Medical Society at a meeting at the Fajardo District Charity Hospital, Fajardo, recently, on "Coronary Artery Disease in Puerto Rico." Dr. Guillermo Acosta, Fajardo, was elected president.—Dr. Jose Noya Benitez, San Juan, was recently elected president of the San Juan District Medical Society, and Dr. Federico Hernandez Morales, San Juan, secretary.

**Personal.**—Drs. Charles Walter Clarke and Edward L. Kcyes, New York, recently spent two weeks in Puerto Rico participating in a congress on venereal diseases held by the department of public health of the School of Tropical Medicine of the University of Puerto Rico, San Juan, in cooperation with the insular department of health.—Drs. Clifford



W. Wells, San Jose, Costa Rica, and Porter J. Crawford, Havana, Cuba, both of the Rockefeller Foundation staff, recently spent several days on the island visiting the health department and medical institutions.

## GENERAL

**Psychologic Literature of Aviation.**—At the request of the Civil Aeronautics Authority, a systematic classification of the psychologic literature of aviation is being prepared by the WPA psychologic index project. The work, which includes 10,000 references totaling about 120,000 words, is intended for use by the physicians, officers, psychologists and technicians of the U. S. Army, Navy and Air Corps. It has been proposed that the WPA project follow up this study by selecting, abstracting, indexing and publishing current literature on the subject beginning with the middle of 1939, thus maintaining a complete up to date abstracting and indexing service on the psychology of aviation.

**Surgeons Announce Memorial to Dr. Horsley.**—The Southern Society of Clinical Surgeons has voted to establish a memorial to the late Dr. John S. Horsley Jr., Richmond, Va., a charter member of the society, who was killed in an automobile accident in November 1940, the first member to die in the organization's fifteen years' existence. A bronze tablet will be erected in St. Elizabeth's Hospital, Richmond. The action was taken during the society's recent annual session in Richmond. Dr. Charles B. Morton II, Charlottesville, Va., was elected president of the society at this meeting, succeeding Dr. James S. Speed, Memphis. Other officers include Drs. Malcolm D. Thompson, Louisville, Ky., vice president, and William P. Nicolson Jr., Atlanta, secretary-treasurer. The 1942 meeting will be in St. Louis.

**Committee Seeks Psychiatrists.**—The National Committee for Mental Hygiene wishes to get in touch with physicians who have had some psychiatric service and might be available during the emergency to help keep up the work of some mental hospital. The committee's request continues: "Some may be doing things which they consider not especially important; some may have retired. Obviously a person whose physical health makes him incapable of good service would not be available, but age of itself will not be considered very detrimental when medical staffs are short. It is requested that all those who see this notice inform the National Committee (1790 Broadway, New York City) of the name and address of any such physician. Many such men have not been actively engaged in psychiatry of late and hence are not members of psychiatric organizations, but their mental hospital experience in former years may have been of very good standard."

**Society for Investigative Dermatology.**—The fourth annual meeting of the Society for Investigative Dermatology will be held June 3 at the Hotel Allerton, Cleveland, under the presidency of Dr. Jesse Bedford Shelmire, Dallas, Texas. The program will include the following speakers:

- Dr. Shelmire, Study of Sensitivity to Poison Ivy.
- Dr. Morris H. Goodman, Baltimore, The Artificial Blister in the Study of Eosinophils with Particular Reference to Dermatitis Herpetiformis.
- Drs. Hamilton Montgomery, Rochester, Minn., and Morris Waisman, Chicago, Arsenical Epitheliomas.
- Drs. Frank E. Cormia and William W. Bryan, Montreal, Individual Action and Summation Effects of X-Ray and Commonly Used Dermatology Preparations on the Skin of the Albino Rabbit.
- Dr. Louis Schwartz, Bethesda, Md., Dermatitis from Synthetic Resin in Fabric Finishes.
- Drs. Adolph Rostenberg Jr. and Naomi M. Kanof, Washington, D. C., Studies in Experimental Sensitization of the Eczematous Type in Humans.

**American Human Serum Association.**—The annual meeting of the American Human Serum Association will be held at the College Club, Cleveland, June 2-3, under the presidency of Dr. Stuart Mudd, Philadelphia. The meeting will be devoted to a symposium on blood substitutes and blood transfusion, with twenty-nine papers listed and others to be presented in abstract if time permits. Among the presentations will be:

- Morton F. Mason, Ph.D., and Dr. Alfred Blalock, Nashville, Tenn., The Use of Heat and Cold in Prevention and Treatment of Shock.
- Edwin J. Cohn, Ph.D., Cambridge, Mass., Properties and Functions of the Purified Proteins of Animal and Human Plasma.
- Drs. Sidney C. Madden, and George H. Whipple, Rochester, N. Y., Shock—Plasma Protein Building in Emergencies as Influenced by Intravenous Digests.
- Comdr. Charles S. Stephenson and Comdr. Lloyd R. Newhouser, M. C., U. S. Navy, Washington, D. C., and Dr. Edward H. Cushing, Cleveland, The Present Status of Blood Substitutes for the Navy.
- Drs. Max M. Strumia and John J. McGraw Jr., Bryn Mawr, Pa., Comparative Studies on Methods of Preservation of Plasma.
- Earl W. Florsdorf, Ph.D., Lansdowne, Pa., and Dr. Stuart Mudd, Philadelphia, Large Scale Desiccation of Blood Substitutes from the Frozen State: A Comparison of Currently Available Types of Equipment.
- Drs. Charles H. Best and Donald Y. Solandt, Toronto, Ont., Preparation of Concentrated and Dried Blood Serum as a War Project.
- Dr. Charles R. Drew, Washington, D. C., Blood Plasma for England.

**Save Hospital Rubber Goods.**—A release from the James M. Jackson Memorial Hospital, Miami, Fla., makes an appeal for the conservation of used hospital rubber goods in the interest of national defense. The release includes suggestions recently made by Mr. Harvey S. Firestone Jr. in a radio broadcast last fall:

It would be my suggestion that you sell your hospital's scrap rubber, including that from sheeting, hot water bottles, rubber gloves, tubing, etc., to any scrap dealer who will give you the best price for it. In that way it will find a route to the reclaiming plants, and the hospital will obtain some salvage value from it. Market prices of scrap rubber fluctuate the same as do prices of any other commodities. Further, different prices for the same grades will prevail in different communities because of differences in shipping costs that must be incurred to get the rubber to points where it can be reclaimed. Speaking generally, however, the types of scrap rubber which a hospital can accumulate will vary in price from less than a cent a pound to several cents per pound, with gloves and other "pure gum" articles commanding the higher prices. If the scrap is sorted by articles or grades of rubber, it should bring more than if sold in one bulk lot.

**American Rheumatism Association.**—The eighth annual meeting of the American Rheumatism Association will be held at the Hotel Cleveland in Cleveland, June 2. The speakers will be:

- Drs. Sidney Rothbard, Daniel Murray Angevine and Russell L. Cecil, New York, Influence of Gold Sodium Thiomalate (Mycocrisin) on Prevention of Hemolytic Streptococcus Arthritis in Rats.
- Dr. Albert B. Sabin and Joel Warren, Cincinnati, Curative Effect of Gold Salts in Experimental Chronic Arthritis in Mice with Reference to the Properties of Calcium Aurothiomalate.
- Dr. Richard H. Freyher, Walter D. Block, Ph.D., and Oliver H. Buchanan, M.S., Ann Arbor, Mich., A Study of Gold Metabolism and the Fate of Gold Injected in the Treatment of Arthritis.
- Dr. Edward F. Hartung, New York, Bacteriostatic Action of Serum of Rheumatoid Arthritis Treated with Gold Salts.
- Drs. Currier McEwen, Ernst W. Bergmann and Harry Most, New York, Cytological Study of Synovial Biopsies in Various Types of Arthritis.
- Dr. John Staige Davis Jr., New York, The Liver, An Etiologic and Therapeutic Factor in Certain Types of Blood Disease and in Gout and Gouty Arthritis.
- Dr. George J. Baer, Boston, Fractures in Arthritis.
- Dr. William K. Ishmael, Oklahoma City, Use of Stilbene Derivatives in Treatment of Climacteric Arthralgia.

**Association for Research in Ophthalmology.**—The twelfth scientific meeting of the Association for Research in Ophthalmology will be held in Cleveland at the Hotel Cleveland, June 3, with the following speakers:

- Dr. John G. Bellows, Chicago, Studies in Capsular Permeability and Lens Swelling.
- Drs. Jonas S. Friedenwald and Wilhelm H. Buschke, Baltimore, Relation of Adrenalin to the Secretion of the Intraocular Fluid.
- Dr. Placidus J. Leinfelder, Iowa City, Multiple Extraocular Muscle Transplants in Monkeys.
- Dr. M. Joseph Mandelbaum and Esther U. Mintz, Ph.D., New York, Spectral Sensitivities of the Color Receptors as Measured by Dark Adaptation.
- Dr. Peter C. Kronfeld, Chicago, The Protein Content of the Aqueous Humor in Man.
- Samuel A. Talbot, M.A., and Wade H. Marshall, Ph.D., Baltimore, Physiologic Studies on Neural Mechanisms of Visual Localization and Discrimination.
- Dr. Ludwig von Sallmann, New York, Experimental Contributions to the Problem of Vitreous Detachment.
- Drs. William L. Benedict and Edith M. Parkhill, Rochester, Minn., Gliomas of the Retina: Histogenesis and Histopathologic Classification.

**Annual Golf Tournament at Cleveland.**—The executive committee of the American Medical Golfing Association has added new features to the annual tournament which will be held at Cleveland, Monday June 2, during the annual session of the American Medical Association. There will be sectional contests, for example, between surgeons, internists, orthopedists and other specialists, with a permanent prize to the winner, which will bear the crest of the American Medical Association, the name of the donor and the name of the winner. The eighteen hole players this year will have as many prizes as the thirty-six hole players, and eighteen holes played morning or afternoon will count for the sectional prizes. Those who expect to play should register now with Bill Burns, secretary, American Medical Golfing Association, 2020 Olds Tower, Lansing, Mich. Headquarters will be maintained all day Sunday and Monday, June 1 and 2, in the lobby of the Hotel Statler. The tournament will be played over two of the best golf courses in the Cleveland area, and the local committee has arranged many features of entertainment. Additional information concerning the tournament was published in THE JOURNAL, April 26, page 1935. All male Fellows of the American Medical Association are cordially invited to become members of the American Medical Golfing Association.

**National Science Fund.**—The National Academy of Sciences has announced the organization of a National Science Fund as a foundation to receive gifts for the advancement of science. The fund, directed by a joint board made up of scientists selected from the academy membership and distinguished laymen, is designed to permit donors who wish to

promote human welfare through support of scientific research to take advantage of the facilities of the academy and of its agency, the National Research Council. The National Science Fund has been organized as the result of a three year study of the present sources of financial support for fundamental research in science, which showed the need to develop additional funds for scientific research. The committee making the study, financed by a grant from the Carnegie Corporation of New York, found that universities and foundations which in the past have been a main support of fundamental scientific research are finding it difficult to provide the necessary funds. Although expenditures for scientific research by industry and by government have increased greatly in recent years, this expansion has not covered, nor can it hope to cover adequately the fields of fundamental research which have derived support largely from other sources, the release said. Twelve lay members were appointed to the first board of directors and twenty scientific directors were named from the academy's own membership. William J. Robbins, director of the New York Botanical Garden, is acting chairman of the board.

**Section Chairmen for National Nutrition Conference.**—Federal Security Administrator Paul V. McNutt has announced the chairmen of sections which will convene in the afternoon sessions of the National Nutrition Conference for Defense in Washington, D. C., May 26-28. The sections will consider definite aspects of nutrition and will formulate recommendations for consideration by all the delegates. The sections and their chairmen are:

Research and national nutrition problems: Elmer V. McCollum, Sc.D., professor of biochemistry, Johns Hopkins University School of Hygiene and Public Health, Baltimore, chairman.

Economic policy and social responsibility: Miss Lucy Gillette, Community Service Society, New York, and Hazel Kirk, Ph.D., associate professor of home economics, University of Chicago, co-chairmen.

Public health and medical aspects of nutrition (with special reference to needs of women and children): Drs. Russell M. Wilder, Rochester, Minn., chairman of the committee on food and nutrition of the National Research Council, and Richard M. Smith, Boston, president of the American Academy of Pediatrics, co-chairmen.

Nutrition for defense workers in industry: Dr. Frank G. Boudreau, executive director, Milbank Memorial Fund, New York, chairman.

Methods of general education in nutrition: Miss Dorothy Williams, Cornell University, Ithaca, N. Y., and Miss Mildred Weigley Wood, director of home economics education, public schools, Phoenix, Ariz., co-chairmen.

Professional nutrition: Lydia J. Roberts, Ph.D., professor of home economics, and Dr. John H. Musser, of Louisiana School of Medicine, New Orleans, co-chairmen.

Distribution and processing of foods (with reference to consumer problems): Lawrence V. Burton, New York, editor of *Food Industries*, and Hector Lazo of the Cooperative Food Distributors of America, co-chairmen.

Community planning for nutrition: Mr. Howard E. McCloskey of the American Youth Commission and Harry C. Ramsower, director of the agricultural extension division, Ohio State University, Columbus, co-chairmen.

General sessions of the conference will be held each morning. Among government officials who will participate are Vice President Henry A. Wallace; Secretary of Agriculture Claude R. Wickard; Secretary of Labor Frances Perkins; Brig. Gen. Lewis B. Hershey, director of the Selective Service System; Milburn L. Wilson, director of extension work, U. S. Department of Agriculture; Surgeon General Thomas Parran, U. S. Public Health Service; Assistant Secretary of State Adolf A. Berle Jr.; Miss Harriet Elliott of the Office of Price Administrator and Civilian Supply; Dr. William H. Sebrell Jr., U. S. Public Health Service; Louise Stanley, Ph.D., chief of the Bureau of Home Economics; Helen Mitchell, Ph.D., director of nutrition for the Federal Security Agency; Miss Edna P. Amidon of the Office of Education and Dr. Martha M. Eliot of the Children's Bureau, U. S. Department of Labor. Others who will address general sessions include Mrs. Franklin D. Roosevelt; John R. Murlin, Ph.D., professor of physiology, University of Rochester, Rochester, N. Y.; Henry C. Sherman, Ph.D., professor of nutrition, Columbia University, New York, and Dr. Wilder.

## CANADA

**Cancer Services in Alberta.**—Dr. George H. Malcolmson, Edmonton, has been appointed director of cancer services for the province of Alberta. He will establish two diagnostic and treatment centers for the present, each with an internist, a surgeon, a pathologist and a radiologist. The government has made available \$50,000 for the work. Treatment for the present will be limited to radium and roentgen ray treatment in curable cases, according to the *Canadian Medical Association Journal*.

**Postgraduate Course in Winnipeg.**—Dr. James S. McCartney, associate professor of pathology, University of Minnesota Medical School, Minneapolis, was the guest speaker at a postgraduate course offered by the University of Manitoba

Faculty of Medicine in Winnipeg, recently. Dr. McCartney took part in several discussions and addressed the Winnipeg Medical Society on "Pulmonary Embolism and Thrombosis."

## LATIN AMERICA

**Congress of Plastic Surgery.**—The First Latin American Congress of Plastic Surgery will be held in Rio de Janeiro and São Paulo, Brazil, July 6-12, under the sponsorship of the Latin American Society of Plastic Surgery. Dr. Antonio Prudente, São Paulo, is president of the congress, and correspondence may be directed to him at Rua Benjamin Constant, 171-1.

**Urologists Honored.**—Drs. William F. Braasch, Rochester, Minn., Joseph F. McCarthy and Robert Gutierrez, New York, were made members of the Cuban Society of Urology at a meeting in Habana recently. All were present and presented papers as follows: Dr. Braasch, "Hypertension and Surgical Kidney"; Dr. McCarthy, "Instrumental Surgery on the Suprannated," and Dr. Gutierrez, "Surgery of Prostatic Stones."

**Society News.**—The first national congress of school health for Brazil was held in São Paulo, April 21-27, according to *Brasil-Médico*. Official themes included organization and orientation of school health services, physical and mental health of teachers, morbidity and mortality among students, the problem of repeaters in the primary schools, mental hygiene and nutrition.—Dr. Leonard Averett, Philadelphia, addressed the Cuban Obstetrical and Gynecologic Society in Habana recently on "Vaginal versus Abdominal Hysterectomy." He also conducted an operative clinic at the Mercedes Hospital.—Dr. Albert B. Sabin, Cincinnati, addressed members of the Finlay Institute and the Cuban Microbiological Society in Habana, April 7, on "The Nature of Human Poliomyelitis."

## Government Services

### Physicians Wanted for the CCC

Vacancies now exist in the CCC in the Eighth Corps Area (Colorado, Arizona, New Mexico, Oklahoma and Texas) wherein the services of physicians can be utilized as camp physicians. Applicants for these positions must be graduates of approved medical schools, must be licensed to practice medicine in at least one state and must be physically qualified. Applications should be addressed to the surgeon, CCC Headquarters, Eighth Corps Area, Fort Sam Houston, Texas. If selected, physicians must report to their first duty station at their own expense and, on being relieved from duty, return transportation must also be at the expense of the individual. They will be required to furnish necessary medical treatment to the personnel of CCC camps and in addition will be required to perform such other duties as may be directed by their superior officers.

### Dr. Coffey Named Assistant Surgeon General

Dr. Erval R. Coffey, formerly assistant chief, domestic quarantine division, U. S. Public Health Service, has been appointed assistant surgeon general to head the division of sanitary reports and statistics. Dr. Coffey's new work will include direction of public relations for the health service. Dr. Coffey graduated at the University of Kansas School of Medicine in 1923, joining the public health service May 24, 1924 with the rank of assistant surgeon. His service includes inspection of immigrants at Ellis Island, direction of health activities for the Mississippi River flood refugees, as director of local health services, Missouri State Department of Health, southeastern Missouri, and malarial investigation in the field office of the public health service at Richmond, Va. From May 1933 to June 1937 he served as state director of health of Washington on loan from the federal service, reorganizing Washington's health services at the request of the state. From June 1937 until September 1938 Dr. Coffey administered federal grants-in-aid to the states of New York, New Hampshire, Maine, Vermont, Connecticut, Massachusetts, Rhode Island, New Jersey and Pennsylvania, as regional consultant of the U. S. Public Health Service. He undertook this work on a national scale as assistant chief of the domestic quarantine division. He is a member of the governing council of the American Public Health Association.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

March 22, 1941.

#### Bombing Hospital Ships

The British Admiralty announces that the standards of conduct exhibited by the enemy in the warfare in the Mediterranean area has undergone a distinct change since it became necessary for Germany to render assistance to Italy. On two occasions recently the hospital ship *Dorsetshire* has been attacked by German aircraft. Fortunately the ship was not hit on either occasion. The *Dorsetshire* is clearly labeled a hospital ship and its identity as such has been made known to the enemy in accordance with the requirements of international law.

During the first seven months of the war against Italy, Malta was subjected to many air attacks, but in none were deliberate attacks made on the hospitals. Since the appearance of German aircraft in the central Mediterranean the Imtarfa hospital at Malta has been deliberately attacked. Even Germany's ally has suffered. On the afternoon of January 8 a merchant ship evacuating Italian prisoners of war from the Libyan coast was attacked by two enemy aircraft, believed to have been German. This resulted in a large number of casualties to the Italian prisoners, many of which were fatal. When the British captured the important Libyan port of Benghazi the Italians announced that they had surrendered the town in order to avoid damage to private property and loss of life among the civilian population. This shows that the frequent British air attacks, made before the surrender, had been confined to military objectives. But since the British occupation Benghazi has been subjected to repeated air attacks by German aircraft. These attacks have caused loss of life among the Italian civilian population and damage to private property in the residential quarters.

#### War Injuries of the Spine

At the Section of Surgery of the Royal Society of Medicine, Mr. Julian Taylor discussed war injuries of the spine. His experience during the last war showed that they fell into two classes—the larger, which might be called the civil group, in which automobiles or falling masonry were the usual causes, and the smaller, due to projectiles. The damage to the cord and the effect on the functions were similar in the two classes and there was a high proportion of neurologically complete interruptions. There might be complete severance, physiologic interruption due to crushing without severance or what is called spinal concussion or shock. These were instantaneous events, but at the site of crushing, bleeding usually occurred later and tended to spread up and down the substance of the cord in more or less cylindric form, producing later cavities containing clear fluid.

The effect on the conductivity of the cord might be transient except in cases of severance. But, as Sergent and Trotter found, no return of function occurred after early complete paraplegia. Hemorrhage into the substance of the cord might produce increasing interruption, due at first to continued effusion of blood and later to the reaction to its presence. A partial lesion might be recognized by persistence below its site of sensibility, motor power or reflex activity. It indicated that the violence which reached the cord was slight, and useful recovery might be hoped for; but it might take a year or more. These partial lesions were the only ones worth operative or manipulative treatment with a view to relieving pressure. Experience in the present war suggested that they were of great rarity in both the classes mentioned. In less than one sixth of the projectile cases the question of surgical relief might

be considered, but in the majority, even of these, it was likely ultimately to be rejected.

In an incomplete lesion the presence of metallic or bony fragments might cause persistent pressure on the cord, and these fragments should be removed. It was rare for a metallic fragment to be held up in the spinal canal, for the energy necessary to penetrate the canal or fracture its walls would usually carry it out again. A reason for removing metallic fragments irrespective of position was the prevention of infection. When entrance wounds were suppurating freely they should be rendered as clean as possible by a superficial drainage operation before removing the foreign body. In penetrating wounds of the central nervous system meningitis was common in neglected cases. In staphylococcic meningitis sulfapyridine was useful.

In at least 5 cases out of 6, transport, nursing and management of the bladder were the beginning and end of treatment. For retention of urine three methods were available: regular catheterization, the tied-in catheter and suprapubic drainage. Each had its disadvantages. For the patient who might recover vesical function he recommended the first, and also for the one likely to develop automatic micturition. For the one not going to improve (for example one with a lesion of the cauda equina) he recommended suprapubic cystostomy with lavage at low pressure. For the one who had to travel a long distance in an ambulance a tied-in catheter, scrupulously arranged, was probably the least harmful.

#### Decentralization of Health Services

Measures to deal with attacks from the air on the civilian population and the threat of invasion include decentralization of the local government normally exercised at Whitehall, London. The country has been divided into twelve districts, each in charge of a regional commissioner, who ensures coordination between the local authorities and the new organization of a million civil defense workers—wardens, shelter marshals, police, fire fighters, rescue and demolition men and civil defense cadets. In this scheme the Ministry of Health plays an important part. It has primary responsibility for rest centers, evacuation and billeting, health hostels and housing, hospitals and first aid posts, sanitation and water supply. The reception of thousands of mothers and children in the countryside has demanded the provision of clubs, nursery centers, communal feeding, bathing and laundries, and an emergency maternity service. Several stately homes are now put to new purposes. Sixty houses, with a capacity for three thousand births a month, are maintained for London mothers alone. Nursing staffs are usually drawn from town hospitals, and nearly everywhere the medical arrangements have proved to be above criticism. The clash of standards between urban and rural authorities has already effected substantial improvement in parts of the countryside.

In evacuation or target areas the education department, with its buildings and its administrative, medical and domestic science staffs, has rendered valuable service in manning rest centers. With the help of the Ministry of Food, cook-houses, municipal feeding and mobile canteens are speedily adapted from school and communal feeding to an emergency service.

#### Hospitals' Radon Center

As the result of the gift from the British War Relief Society of New York, further supplies of radon are now assured. The gift was made to the British Hospitals Association, which has asked the Middlesex Hospital (whose association with radiotherapy is well known) to administer it. In the first instance it will be necessary to make a charge for the radon, but this has been fixed at the lowest rates obtaining at the Medical Research Council: 24 cents a millicurie, with a reduction to 12 cents for any quantity in excess of 50 millicuries. It is hoped that some arrangement will soon be possible by which the burden of such payments can be lightened.

## Deaths

**Frank B. Young** \* Long Beach, Calif.; Kansas City (Mo.) Medical College, 1900; member of the state board of health; was president of the Long Beach Academy of Medicine and secretary of the Harbor Branch of the Los Angeles County Medical Society; vice president of the executive staff of the Community Hospital; member of the staffs of the Seaside and St. Mary's hospitals, Long Beach, and of the Hollywood Hospital; police surgeon; at one time director and president of the state board of health of Arkansas; past president of the state board of medical examiners of Arkansas; formerly physician in charge of the State Hospital for Nervous Diseases, Little Rock; past president of the Scottsbluff County (Neb.) Medical Society; formerly on the staff of the Methodist Hospital, Scottsbluff, Neb.; lieutenant commander of the medical reserve corps of the United States Navy; aged 62; died, March 5, of cerebral hemorrhage.

**Thomas A. Woodruff** \* New London, Conn.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1888; third vice president of the American Medical Association in 1908, and member of its House of Delegates in 1909, 1910 and 1913; past president of the Chicago Ophthalmological Society; member of the American Academy of Ophthalmology and Otolaryngology and of the Association for Research in Ophthalmology; served during the World War; fellow of the American College of Surgeons; consulting ophthalmologist, Lawrence and Memorial Associated Hospitals; formerly ophthalmic surgeon, St. Luke's Hospital and St. Anthony de Padua Hospital, Chicago; co-author of "Commoner Diseases of the Eye"; aged 75; died, April 15, of chronic endocarditis.

**Cyril K. Valade** \* Detroit; Detroit College of Medicine and Surgery, 1916; member of the American Academy of Dermatology and Syphilology; past president of the Detroit Dermatological Society; served during the World War; instructor in dermatology and syphilology at the Wayne University College of Medicine; aged 49; at various times and in various capacities served on the staffs of the Receiving Hospital, St. Joseph's Mercy Hospital and the Harper Hospital, where he died, March 26, of coronary thrombosis.

**Frederick Leslie Benton** \* Medical Inspector, Commander, United States Navy, retired, Washington, D. C.; Columbia University College of Physicians and Surgeons, New York, 1896; Universidad de la Habana Facultad de Medicina y Farmacia, Cuba, 1907; fellow of the American College of Surgeons; entered the navy in 1898 and retired Dec. 1, 1929; on the staffs of the Episcopal Eye, Ear and Throat Hospital and the George Washington University Hospital; aged 66; died, April 8, of a self-inflicted bullet wound.

**William Fitch Cheney** \* San Francisco; Cooper Medical College, San Francisco, 1889; clinical professor of medicine from 1909 to 1932 and since 1932 emeritus professor at the Stanford University School of Medicine; member of the American Gastro-Enterological Association; fellow of the American College of Physicians; formerly professor of principles and practice of medicine at his alma mater; aged 74; died, April 10.

**John Joseph Dailey** \* McAdoo, Pa.; Medico-Chirurgical College of Philadelphia, 1905; past president of the Schuylkill County Medical Society; served during the World War; was president of the board of health of McAdoo; past president of the Association of Ex-Resident and Resident Physicians of the Philadelphia General Hospital; medical director of the public schools; aged 57; died, March 28, of coronary thrombosis.

**Leslie Rutherford** \* Peoria, Ill.; Rush Medical College, Chicago, 1901; president of the city board of health; past president of the Peoria City Medical Society; chief physician for the draft board; at various times president of the staffs of the Proctor Hospital and the Methodist Hospital; aged 61; died, March 28, in the James M. Jackson Memorial Hospital, Miami, Fla., of cerebral hemorrhage.

**Clifford Rispin Orr** \* Buffalo; University of Buffalo School of Medicine, 1898; assistant professor of radiology at his alma mater; member of the Radiological Society of North America and the American College of Radiology; served during the World War; for many years on the staff of the Edward J. Meyer Memorial Hospital; aged 74; died, March 15, of coronary thrombosis.

**Benson Blake Martin** \* Vicksburg, Miss.; Tulane University School of Medicine, New Orleans, 1898; fellow of the American College of Surgeons; medical director and superintendent of the Vicksburg Infirmary; aged 64; died, March 9, in the Baptist Hospital, New Orleans, of obstruction of the common bile duct, cirrhosis of the liver and toxemia.

**Arthur Jesse Edgar Decker**, Illmo, Mo.; Central Medical College of St. Joseph, 1899; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; served during the World War; aged 73; died, March 8, in the Veterans Administration Facility, Jefferson Barracks, of heart disease and chronic nephritis.

**William Dunn Madden**, Clinton, Iowa; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1903; member of the Iowa State Medical Society; served during the World War; at one time coroner of Cascade County, Mont.; aged 64; died, March 29, in the Mercy Hospital of cerebral hemorrhage.

**Charles Walton Sheldon**, Wellsboro, Pa.; Medico-Chirurgical College of Philadelphia, 1904; member of the Medical Society of the State of Pennsylvania; at one time medical director of Tioga County; president of the Tioga County Medical Society; aged 64; died, March 2, in St. Petersburg, Fla., of coronary thrombosis.

**Roland Bain Macon**, Clarksville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1898; Jefferson Medical College of Philadelphia, 1901; member of the Tennessee State Medical Association; for many years chairman of the medical committee of the Clarksville Hospital; aged 65; died, March 15, of heart disease.

**Marion Lee Compton**, Augusta, Ga.; University of Texas School of Medicine, Galveston, 1917; member of the American Psychiatric Association; fellow of the American College of Physicians; served during the World War; on the staff of the Veterans Administration Facility; aged 46; died, March 27, of heart disease.

**Edwin Hicks Van Deusen** \* Vineland, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1880; past president of the Cumberland County Medical Society; on the staff of the Newcomb Hospital; aged 81; died, March 20, in the Orlando (Fla.) Hospital of coronary occlusion and arteriosclerosis.

**John Irvine McKelway**, Orofino, Idaho; University of Pennsylvania Department of Medicine, Philadelphia, 1897; member of the American Psychiatric Association; served during the World War; superintendent of the State Hospital; aged 65; died, April 7, of carcinoma of the throat and coronary thrombosis.

**Fernande Hachat Luck**, Indianapolis; Indiana University School of Medicine, Indianapolis, 1912; at one time assistant university physician at Indiana University; formerly state physician at the Indiana Woman's Prison and the Indiana Girls' School; aged 50; died, March 25, of cerebral hemorrhage.

**Gilbert McClellan Mason** \* Boston; Boston University School of Medicine, 1898; served during the World War; demonstrator in anatomy at his alma mater from 1901 to 1910; formerly on the staffs of the Carney and Forest Hills hospitals; aged 68; died, March 17, of coronary thrombosis.

**William Guy Townsend** \* Acting Assistant Surgeon Lieutenant (j. g.) United States Navy, retired, Baltimore; University of Maryland School of Medicine, Baltimore, 1888; entered the navy Aug. 24, 1921 and retired Sept. 1, 1935; aged 76; died, March 12, of carcinoma of the prostate.

**Thomas Molloy Harris**, Pilot Point, Texas; Fort Worth School of Medicine, Medical Department of Fort Worth University, 1901; member of the State Medical Association of Texas; past president of the Denton County Medical Society; aged 62; died, March 18, of cerebral hemorrhage.

**Charles S. Parker**, Kings Park, N. Y.; Syracuse University College of Medicine, 1909; member of the Medical Society of the State of New York and the American Psychiatric Association; superintendent of the Kings Park State Hospital; aged 54; died, March 28, of chronic myocarditis.

**Francis Hebron Husband** \* Sault Ste. Marie, Mich.; University of Michigan Homeopathic Medical School, Ann Arbor, 1901; fellow of the American College of Surgeons; on the staff of the Chippewa County War Memorial Hospital; aged 63; died, March 16, of monocytic leukemia.

**LaMott Fair Bates** \* Durand, Mich.; University of Michigan Medical School, Ann Arbor, 1924; for many years president of the school board; past president of the Shiawassee County Medical Society; on the staff of the Durand Hospital; aged 39; died, April 5, of cerebral hemorrhage.

**Samuel Marion Stone**, Charleston, W. Va.; University of the South Medical Department, Sewanee, Tenn., 1904; Medical College of Virginia, Richmond, 1916; on the staff of the Charleston General Hospital; aged 60; died, March 16, of carcinoma of the pleura and Buerger's disease.

**Joseph Lemen Reeve**, Edwardsport, Ind.; University of Louisville (Ky.) Medical Department, 1881; member of the Indiana State Medical Association; county health officer; formerly member of the state legislature; aged 83; was found dead, March 13, of chronic myocarditis.

**Jonathan Clinton Foltz**, New Haven, Conn.; University of Pennsylvania Department of Medicine, Philadelphia, 1888; formerly surgeon, United States Public Health Service reserve; served during the World War; aged 76; died, April 13, in Corpus Christi, Texas, of pneumonia.

**Alfred Cole Wallin** Ⓢ Matawan, N. J.; Columbia University College of Physicians and Surgeons, New York, 1896; on the staff of the Dr. E. C. Hazard Hospital, Long Branch; member of the board of health of Matawan; aged 70; died, March 10, of cerebral hemorrhage.

**Milton Waldrop Robertson**, Corinth, Miss.; Birmingham Medical College, 1915; member of the Mississippi State Medical Association; served during the World War; formerly county health officer; aged 52; died, March 2, in the McRae Hospital of massive gastric hemorrhage.

**Thomas C. Moody**, Lake Charles, La.; Tulane University of Louisiana School of Medicine, New Orleans, 1894; member of the Louisiana State Medical Society; past president of the Calcasieu Parish Medical Society; aged 70; died, March 6, of angina pectoris.

**Roy Daniels Stone**, Sully, Iowa; Hering Medical College, Chicago, 1910; member of the Iowa State Medical Society; aged 58; died, March 25, in the Mary Frances Skiff Memorial Hospital, Newton, of hemolytic streptococcus infection of the throat and pneumonia.

**Jesse Armed Strickland** Ⓢ St. Petersburg, Fla.; University of North Carolina School of Medicine, Chapel Hill, 1910; past president of the Pinellas County Medical Society; on the staff of St. Anthony's Hospital; aged 60; died, March 14, of coronary occlusion.

**Jesse P. Randolph**, Hot Springs National Park, Ark.; St. Louis University School of Medicine, 1906; for many years county coroner; veteran of the Spanish-American War; aged 63; died, March 20, in the Army and Navy General Hospital of arteriosclerosis.

**Henry August Long**, Effingham, Ill.; St. Louis College of Physicians and Surgeons, 1907; member of the Illinois State Medical Society; formerly mayor of Effingham; aged 58; died, March 24, in St. Anthony's Hospital of hypertensive cardiovascular disease.

**Philip Jameson Heuer**, St. Louis; Washington University School of Medicine, St. Louis, 1895; on the associate staffs of the Deaconess, De Paul and Missouri Baptist hospitals; aged 69; died, March 7, of carcinoma of the stomach and gastric hemorrhage.

**Austin Bell** Ⓢ Hopkinsville, Ky.; University of Virginia Department of Medicine, Charlottesville, 1894; president of the Kentucky State Medical Association; veteran of the Spanish-American and World wars; aged 66; died, April 3, of coronary disease.

**Richard Harrison Peake**, Norfolk, Va.; Medical College of Virginia, Richmond, 1915; member of the Medical Society of Virginia; on the staff of the Leigh Memorial Hospital; aged 51; died, March 6, of chronic nephrosis and pulmonary embolus.

**Roger William Moister** Ⓢ Summit, N. J.; New York Homeopathic Medical College and Flower Hospital, New York, 1902; on the staff of the Overlook Hospital; aged 64; died, March 9, in Phoenix, Ariz., of pulmonary tuberculosis.

**Elah Adelbert Lapham** Ⓢ Phillips, Wis.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1911; served during the World War; aged 58; died, March 24, of coronary thrombosis.

**Elmer Ellsworth Perry**, Oak Grove, Mo.; Kansas City Medical College, 1892; for many years a member of the school board; aged 75; died, March 10, in the Wesley Hospital, Kansas City, of myocarditis following influenza.

**Charles Telsey**, Utica, N. Y.; Long Island College Hospital, Brooklyn, 1914; member of the Medical Society of the State of New York; aged 49; on the staff of St. Luke's Hospital, where he died, March 1, of heart disease.

**Samuel Goodall Panter**, Lincoln, Neb.; Omaha Medical College, 1886; St. Louis College of Physicians and Surgeons, 1888; Missouri Medical College, St. Louis, 1891; aged 88; died, March 17, of gastric ulcer and hemorrhage.

**Alexander Gordon MacPherson** Ⓢ Grand Rapids, Mich.; Grand Rapids Medical College, 1902; College of Physicians

and Surgeons, Baltimore, 1903; served during the World War; aged 60; died, March 14, of carcinoma.

**Thomas W. Oberlin** Ⓢ Hammond, Ind.; Northwestern University Medical School, Chicago, 1898; past president of the Lake County Medical Society; aged 65; was killed, March 11, in an automobile accident.

**Peter George Kokenes**, Springfield, Ill.; St. Louis University School of Medicine, 1927; member of the Illinois State Medical Society; aged 43; died, March 7, in St. John's Hospital of cerebral hemorrhage.

**James Weedin Martin**, Drumright, Okla.; Missouri Medical College, St. Louis, 1879; member of the Missouri State Medical Association; aged 86; died, March 1, of chronic nephritis and myocarditis.

**Thomas Aloysius Mulcahy**, New York; Columbia University College of Physicians and Surgeons, New York, 1901; aged 64; died, March 3, of arteriosclerosis, hypertension and cerebral hemorrhage.

**James Jay Pattee** Ⓢ Pueblo, Colo.; Rush Medical College, Chicago, 1895; fellow of the American College of Surgeons; on the staff of St. Mary's Hospital; aged 72; died, March 20, of heart disease.

**Charles Jesse Hutton** Ⓢ Atlanta, Ill.; Barnes Medical College, St. Louis, 1911; aged 59; died, March 19, in the Evangelical Deaconess Hospital, Lincoln, of nephritis and coronary embolism.

**Elmore R. Miller**, Ephrata, Pa.; University of Maryland School of Medicine, Baltimore, 1892; deputy coroner and for many years county coroner; aged 72; died, March 4, of coronary occlusion.

**James Wallace Weir**, Sparta, Ill.; Missouri Medical College, St. Louis, 1882; member of the Illinois State Medical Society; aged 90; died, March 2, in the Community Hospital of pneumonia.

**Reuben R. Roach**, New Market, Tenn.; Tennessee Medical College, Knoxville, 1902; member of the Tennessee State Medical Association; aged 65; died, March 15, of cerebral hemorrhage.

**Joseph Burns McPherson** Ⓢ Hastings, Neb.; John A. Creighton Medical College, Omaha, 1905; at one time a police surgeon in Omaha; aged 62; died, March 10, of coronary occlusion.

**William Edwin Kidd**, Oak Park, Ill.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1891; aged 70; died, March 19, in the Chicago Memorial Hospital of arteriosclerosis.

**Charles Beatty Kenney**, East Chicago, Ind.; University of Georgia School of Medicine, Augusta, 1924; aged 39; died, March 15, in Highland of angina pectoris and hypertension.

**Albert G. Huegli** Ⓢ Detroit; Detroit College of Medicine, 1901; aged 62; secretary of the medical staff of the Deaconess Hospital, where he died, March 7, of intestinal obstruction.

**James M. McClanahan**, Kirkwood, Ill.; Chicago Medical College, 1874; member of the Illinois State Medical Society; aged 90; died, March 24, of bronchopneumonia.

**Meyer B. Lichtenstein** Ⓢ Pittsburgh; University of Pittsburgh School of Medicine, 1910; aged 57; died, March 11, in Miami Beach, Fla., of coronary thrombosis.

**Edward E. Thomas**, Coolidge, Texas; University of Dallas Medical Department, 1902; aged 70; died, March 1, of injuries received in an automobile accident.

**Edward Fellmer Kopetschny**, Jersey City, N. J.; Bellevue Hospital Medical College, New York, 1886; aged 78; died, March 23, of coronary thrombosis.

**Emil F. R. Liebrecht**, Chicago; Jenner Medical College, Chicago, 1912; aged 78; died, March 23, in the Illinois Masonic Hospital of coronary thrombosis.

**Charles C. Neff** Ⓢ York, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1899; aged 69; died, March 4, of coronary occlusion.

**Edgar Braxton Provine**, Grenada, Miss.; Memphis (Tenn.) Hospital Medical College, 1899; aged 66; died, March 12, of cirrhosis of the liver.

**Woodruff A. Banks**, Chattanooga, Tenn.; Chattanooga Medical College, 1906; aged 59; died, March 21, of myocarditis and diabetes mellitus.

**Lunsford Hoxsey Lewis**, Elkton, Va.; Medical College of Virginia, Richmond, 1910; aged 60; died, March 8, of a self-inflicted bullet wound.



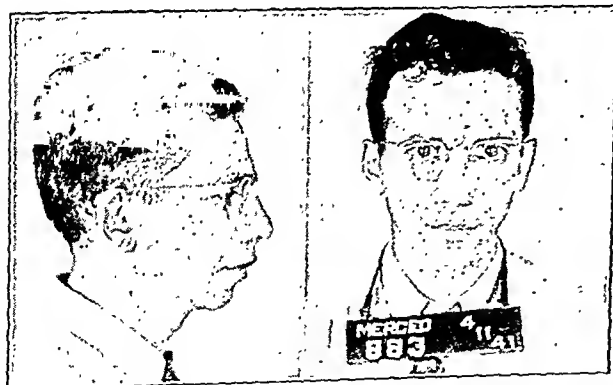
## Bureau of Investigation

### REPEATER REPEATS

In *THE JOURNAL*, Feb. 1, 1941, the Bureau of Investigation disclosed the activities of an impostor, one Aaron W. Raffelson, who had been previously described in these pages in 1934. The files of the Bureau contain the names of many persons who frequently repeat their activities as impostors. With each new



The photographs reproduced above were taken by the New York City authorities in 1930. The center picture is a reproduction of one taken by the New Mexico authorities in 1934. The photographs reproduced below were taken in April 1941 by the California authorities.



offense publicity is given in the hope that publication of their pictures and the data concerning them will militate against further repetition of their performances.

Once again the California Board of Medical Examiners is to be congratulated on the rapidity with which it is able to take action against medical impostors. On Dec. 9, 1940, a physician in Newman, Calif., informed the board that an individual who was employed as a bacteriologist at the California Milk Products Company in Gustine, Merced County, was posing as a physician licensed in another state. The doctor's suspicions were aroused when he noted that the bacteriologist was dyeing his hair red, but further information was not received at that time.

On April 9, 1941, this physician informed the board by long distance telephone that the bacteriologist had been identified through a picture appearing in *THE JOURNAL* for February 1 as Aaron W. Raffelson. Raffelson was first employed by the company in October 1940. He had assisted a physician in Gustine in giving anesthetics and advice and had treated the physician's wife for bronchitis. He had married a Gustine school teacher on Jan. 31, 1941, at Reno, Nev.

The investigator for the board, T. P. Hunter, states that Raffelson accounted for the four years spent in the New Mexico State Penitentiary by stating that he had studied in Vienna during that time and had served with the Loyalist forces during the Spanish war. On the strength of this claim, he had addressed a local club on his experiences in Spain, despite the fact that he had never seen that country.

According to this same investigator, when the February 1 issue of *THE JOURNAL* arrived in Gustine, Raffelson carefully called at each doctor's office, borrowed that issue of *THE JOURNAL*, tore out page 433 and defaced numbers of adjacent pages so that the numbers of the pages would not be noticed. However, one copy of *THE JOURNAL* had arrived with its wrapper torn off, and the local postmistress, in leafing through the magazine, had noticed Raffelson's picture and informed his employer. The employer confronted Raffelson with the article, and the latter admitted the truth of the statements but explained that he had been forced to leave New York University School of Medicine because he had committed an abortion under the name of Aaron W. Raffelson, and that he had gone to the University of Colorado and enrolled there under his true name, which, he claimed, was that of the physician whose diploma he held. He further told his employer that after he had received his diploma he was afraid to practice under this "true" name because of his record in New York, but he insisted that he was a bona fide graduate physician.

On April 9 Raffelson told the investigator for the California board that he had had one year's medical training at New York University and had forged credentials of a fellow student and had obtained junior standing at the University of Colorado, and finally that the diploma which he held was bona fide. He agreed, however, to surrender the document on the basis of its having been obtained on forged credentials. Some forty minutes later he changed his story and stated that the diploma was not bona fide and that he had had it printed in Amarillo, Texas, during August 1940, that his true name was David Dressler (another pseudonym which he has used in the past; incidentally, the real David Dressler is an officer of the state of New York) and that under this name he had attended New York University School of Medicine for three years. He signed a statement to this effect, and twelve minutes later stated that Dressler was not his true name but that he did not care to give his true name and that the name of the physician appearing on the diploma was not his true name.

He admitted having been in Colorado following his release from the New Mexico State Penitentiary in February 1939, at which time he had posed as a New York physician (see previous article in *THE JOURNAL*). He also stated that he had lived with a young woman in Denver for seven months but had never been married to her.

A complaint was issued, charging Raffelson with two violations of the Business and Professions Code of California, and a warrant was issued. Raffelson was arrested and, when searched, was found to have a 1/4 ounce bottle of strychnine sulfate in his possession. The investigator stated that Raffelson intimated that he had contemplated suicide. He was transported to Merced and booked in the Merced County sheriff's office as 883 (see accompanying photographs).

When Raffelson was brought to court, he pleaded guilty to one count of the charge, while the second count was dismissed on motion of the district attorney. He waived time for passing sentence, and the court ordered him to be confined in San Quentin State Prison for the term prescribed by law (one to three years). In answering the routine questions of the court before imposition of sentence, he claimed that his true name was David Dressler, that he was born in 1906 in Dublin, Ireland, coming to the United States in 1908, and that he had received a bachelor's degree from the University of London. England, having been a resident there from 1922 to 1926. He:



claimed to have had three years' medical training in some New York medical school which he refused to name. He stated that he had a heart deficiency and at present was taking a daily maintenance dose of digitalis but that otherwise he was healthy.

The diploma which Raffelson had in his possession was found, in fact, to be a bona fide diploma which was apparently stolen from the physician to whom it belonged. It will be recalled that when Raffelson was in Denver he married a Denver girl, but information received since the publication of the last article indicates that that marriage was annulled on Dec. 21, 1940. Reproduced with this article are photographs, the first group taken by the New York authorities in 1930, the second by New Mexico authorities in 1934, and finally a current one taken by the California authorities.

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### NATIONAL BOARD OF MEDICAL EXAMINERS

##### EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in *THE JOURNAL*, May 17, page 2336.

##### BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 17-19. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

ARIZONA: Phoenix, July 1-2. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

ARKANSAS: \* Medical, Little Rock, June 5-6. Sec., Dr. D. L. Owens, Harrison. Eclectic, Little Rock, June 5-6. Sec., Dr. Clarence H. Young, 1415 Main St., Little Rock.

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, July 14. Written, San Francisco, June 30-July 3. Sec., Dr. Charles B. Pinkham, 1020 N. St., Sacramento.

COLORADO: Denver, July 18. *Applications must be on file not later than June 15.* Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: \* Medical, Written, Hartford, July 8-9. Endorsement, Hartford, July 22. Sec., Dr. Thomas P. Murdock, 149 W. Main St., Meriden. Homeopathic, Derby, July 15-16. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: Jacksonville, June 23-24. Sec., Dr. William M. Rowlett, Box 786, Tampa.

GEORGIA: Atlanta, June. Sec., State Examining Boards, Mr. R. C. Coleman, 111 State Capitol, Atlanta.

HAWAII: Honolulu, July 14-17. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

ILLINOIS: Chicago, June 24-26. Supt. of Registration, Mr. Lucien A. Fife, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 17-19. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, Citizens Trust Bldg., Fort Wayne.

IOWA: Iowa City, June 3-5. Dir., Division of Licensure and Registration, State Department of Health, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

KANSAS: Kansas City, June 17-18. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

KENTUCKY: Louisville, June 5-7. Sec., State Board of Health, Dr. A. T. McCormack, 620 S. Third St., Louisville.

LOUISIANA: New Orleans, June 12-14. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Augusta, July 1-2. Sec., Board of Registration in Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: Medical, Baltimore, June 17-20. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. Homeopathic, Baltimore, June 17-18. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 8-11. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: \* Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MISSOURI: St. Louis, May 29-31. Sec., State Board of Health, Dr. Harry F. Parker, State Capitol Bldg., Jefferson City.

NEBRASKA: \* Omaha, June 12. *All applications must be on file not later than May 29.* Dir., Mrs. Jeanette Crawford, 1009 State Capitol Bldg., Lincoln.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 17-18. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 23-26. Chief, Bureau of Professional Examinations, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 16-20. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 1-4. Sec., Dr. G. M. Williamson, 41 1/2 S. Third St., Grand Forks.

OHIO: Practical, June 11 and 14. Written, June 12-13. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, June 11-12. Sec., Dr. James D. Oshorn Jr., Frederick.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 8-12. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: \* July 10. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 23-25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: \* Pierre, July 15-16. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

TEXAS: Austin, June 16-18. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

VERMONT: Burlington, June 17-19. Sec., Dr. F. J. Lawliss, Richford.

VIRGINIA: Richmond, June 17-20. Sec., Dr. J. W. Preston, 30 1/2 Franklin Road, Roanoke.

WASHINGTON: \* Seattle, July 21-23. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WEST VIRGINIA: Wheeling, July 7-9. Sec., Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: \* Milwaukee, June 24-27. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

WYOMING: Cheyenne, June 2-3. Sec., Dr. M. C. Keith, Capitol Bldg., Cheyenne.

\* Basic Science Certificate required.

#### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, June 17. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

CONNECTICUT: June 14. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

IOWA: Des Moines, July 8. Dir., Division of Licensure and Registration, State Department of Health, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

OREGON: Corvallis, July 12. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 20. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH DAKOTA: June. Sec., Dr. G. M. Evans, Yankton.

WASHINGTON: Seattle, July 17-18. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WISCONSIN: Milwaukee, June 7. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee.

### Minnesota January Report

The Minnesota State Board of Medical Examiners reports the written examination for medical licensure held at Minneapolis, Jan. 21-23, 1941. The examination covered 12 subjects and included 60 questions. An average of 75 per cent was required to pass. Forty-eight candidates were examined, all of whom passed. Two physicians were licensed to practice medicine by reciprocity and 2 physicians so licensed by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Pcr Cent
George Washington University School of Medicine...	(1937)		87.3
Northwestern University Medical School...	(1938) 91.1,	(1939)	87.4
Rush Medical College...	(1938) 89.1,	(1940)	93
Indiana University School of Medicine...	(1934)		85.5
Louisiana State University School of Medicine...	(1940)		83.4
Johns Hopkins University School of Medicine...	(1937)		87.1
(1938) 86,	(1939) 87		
Harvard Medical School...	(1937) 87.4,	(1939)	90.5
University of Michigan Medical School...	(1939)		90.2
University of Minnesota Medical School...	(1938)		88.6
(1940) 83,* 84.1, 84.6,* 85.3,* 85.3,* 86.5,			
86.6,* 87,* 88.3,* 88.3,* 88.5, 89.2, 89.3, 90.3,* 90.6,*			
91.3			
St. Louis University School of Medicine...	(1939)		87
Washington University School of Medicine...	(1935)		89.5
Creighton University School of Medicine...	(1940)		85.2
University of Nebraska College of Medicine...	(1937)		90.5
University of Buffalo School of Medicine...	(1937)		88.3
Univ. of Rochester School of Medicine and Dentistry...	(1934)		82.6
University of Cincinnati College of Medicine...	(1940)		87.3
University of Oregon Medical School...	(1939) 87, 90.3,	(1940)	89.5
University of Tennessee College of Medicine...	(1938)		88.6
Vanderbilt University School of Medicine...	(1938)		88.5
University of Texas Faculty of Medicine...	(1937)		89.2
University of Virginia Department of Medicine...	(1938)		88.4
University of Manitoba Faculty of Medicine...	(1936)		90.4
Queen's University Faculty of Medicine...	(1937)		88.3
University of Western Ontario Medical School...	(1936)		85.6

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
State University of Iowa College of Medicine...	(1939)		Iowa
University of Nebraska College of Medicine...	(1938)		Nebraska

School	LICENSED BY ENDORSEMENT	Year Grad.
Stanford University School of Medicine...	(1938)	
University of Virginia Department of Medicine...	(1938)	

\* This applicant has received the M.B. degree and will receive the M.D. degree on completion of internship

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Taxes (Federal Income): Accounts Receivable as Gross Income for Taxable Year in Which Death Occurs.**—In this case the Supreme Court of the United States held that the fair value of the interest of a decedent physician, who had kept his accounts on a calendar year cash receipts and disbursements basis, in the accounts receivable of a partnership of physicians of which he had been a member must be included, for federal income tax purposes, in his gross income for the taxable year in which death occurred, even though the accounts receivable represent uncollected charges for services rendered in preceding taxable years or may not be collected until some subsequent calendar year. This holding, in the opinion of the Supreme Court, necessarily is called for by 26 U. S. C. A., Internal Revenue Code, Section 42, reading in part as follows:

In the case of the death of a taxpayer there shall be included in computing net income for the taxable period in which falls the date of his death, amounts accrued up to the date of his death if not otherwise properly includible in respect of such period or a prior period.

In the present case, the decedent's death effected a dissolution of a partnership of physicians. Both the decedent and the partnership were on a calendar year cash receipts and disbursements basis. When decedent died about \$69,000 of partnership accounts receivable were outstanding for services rendered to patients during the decedent's lifetime. The decedent's interest in the accounts receivable at their face value was approximately \$27,000. The Commissioner of Internal Revenue set a fair value of that interest at one fifth of its face value—approximately \$5,400—and held that the latter amount must be regarded as a portion of the decedent's gross income for the last taxable year of his life and be taxed accordingly. The commissioner's action was affirmed on successive appeals by the Board of Tax Appeals, the circuit court of appeals, second circuit, and by the United States Supreme Court.—*Pfaff et al. v. Commissioner of Internal Revenue*, 113 F. (2d) 114; 61 S. Ct. 783 (1941).

**Malpractice: Liability of Dentist for Failure to Take Roentgenograms Following Dental Extraction.**—The plaintiff, who was suffering from rheumatism or arthritis, on the advice of her attending physician consulted the defendant dentist as to the advisability of having some of her teeth extracted. The defendant made a roentgenogram of the plaintiff's teeth and determined that eleven of her upper teeth should be removed. Accordingly, on Feb. 13, 1938, he extracted the eleven teeth under a general anesthetic and advised the plaintiff to use a warm mouth wash and to apply alternating hot and cold applications to her face after she returned home. That evening the defendant called at the plaintiff's home and removed a piece of tooth or bone which was protruding from the upper jaw and advised her to continue the mouth wash. The defendant discharged the plaintiff early in March after telling her husband that he had made a "clean job" of the operation and that no roots had been left in her mouth. The defendant later referred her for the fitting of a dental plate to Dr. Ruth, a prosthodontist who, after several visits and treatments, fitted the plaintiff with a temporary plate on March 12. At that time Dr. Ruth observed nothing wrong with the plaintiff's mouth or gums that contraindicated the installation of the plate. The following October the plaintiff returned to Dr. Ruth and complained that the plate did not fit. Dr. Ruth then made a roentgen examination of the plaintiff's mouth and discovered that fragments of the roots of six of the extracted teeth still remained in the plaintiff's jaw. After these roots were extracted it was necessary to install a new plate. Subsequently the plaintiff sued the defendant for damages and obtained a judgment in her favor. The dentist then appealed to the Supreme Court of Appeals of Virginia.

The plaintiff contended that the defendant was negligent in performing the operation in such a manner that the roots remained in her jaw and in failing to disclose to her that the roots still remained when he knew, or should have known, otherwise. A dentist, said the court, does not guarantee or warrant

a cure, and a bad result or a failure to cure is not in itself sufficient to raise an inference or presumption of negligence. Also, a dentist is not required to exercise the highest degree of care and skill known to the profession. On the contrary he is required only to exercise such reasonable and ordinary skill and diligence as are ordinarily exercised by the average of the members of the profession in good standing, in similar localities and in the same general line of practice, regard being had to the state of dental science at the time. In the judgment of the court there was no evidence that the defendant had been negligent in the manner in which he performed the operation or in his treatment of the plaintiff. Neither was there evidence that an examination of the plaintiff's mouth after the operation would have disclosed the presence of the broken roots in her jaw nor was there evidence that an inspection of the extracted teeth would have disclosed that some parts of the roots had been broken off and probably remained in the jaw. The court agreed with the plaintiff that the true condition of her mouth could have been discovered immediately after the operation by the taking of another roentgenogram, but it could not agree with the plaintiff's further contention that the defendant was negligent in failing to make such a roentgen examination. There was, continued the court, no evidence that it was the usual and approved custom and practice of dentists in the community in which the defendant practiced to make a roentgen examination after an extraction, and it cannot be said as a matter of law that it should have been done in the present case. The mere fact that the defendant told the plaintiff's husband that the operation was a success, when in fact he was mistaken, did not prove that the lack of success was in any way due to his negligence. Furthermore, said the court, it cannot be said, as the plaintiff further contended, that the defendant was under an obligation to disclose to the plaintiff that the roots still remained in her jaw or that he concealed that condition from her, because there was not the slightest evidence that the defendant himself had knowledge of that condition. The judgment for the plaintiff was therefore reversed.—*Alexander v. Hill*, 6 S. E. (2d) 661 (Virginia, 1940).

**Workmen's Compensation Acts: Right of an Injured Employee to Select His Own Physician.**—Under the workmen's compensation act of Idaho, said the Supreme Court of that state, the liability of an employer to pay expenses incurred by an employee for medical treatment is contingent on the failure of the former to provide it. If the employer has made adequate treatment available to the employee, he is not liable for other medical services secured by the latter.—*Totton v. Long Lake Lumber Company*, 97 P. (2d) 596 (Idaho, 1939).

## Society Proceedings

### COMING MEETINGS

American Medical Association, Cleveland, June 2-6. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Association for the Study of Allergy, Cleveland, June 2-3. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Tex., Secretary.

American Association for the Surgery of Trauma, Montreal and Montebello, Canada, May 29-31. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.

American Association for Thoracic Surgery, Toronto, Canada, June 9-11. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.

American Association of Genito-Urinary Surgeons, Hot Springs, Va., May 29-31. Dr. Charles C. Higgins, 2020 East 93d St., Cleveland, Secretary.

American Association of Medical Milk Commissions, Cleveland, June 1-2. Dr. Paul B. Cassidy, 2037 Pine St., Philadelphia, Secretary.

American Association on Mental Deficiency, Salt Lake City, June 20-24. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Broncho-Esophagological Association, Cleveland, June 3. Dr. Paul H. Holinger, 1150 North State St., Chicago, Secretary.

American College of Chest Physicians, Cleveland, May 31-June 2. Dr. Paul H. Holinger, 500 North Dearborn St., Chicago, Secretary.

American Gynecological Society, Colorado Springs, May 26-28. Dr. Richard W. TeLinde, Johns Hopkins Hospital, Baltimore, Secretary.

American Heart Association, Cleveland, May 30-31. Dr. Howard B. Sprague, 50 West 50th Street, New York, Secretary.

American Laryngological Association, Atlantic City, May 28-30. Dr. Charles J. Imperatori, 108 East 38th St., New York, Secretary.

American Laryngological, Rhinological and Otolological Society, Los Angeles, June 16-18. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medical Women's Association, Cleveland, June 1-2. Dr. Ella Gray, 649 South Olive St., Los Angeles, Secretary.

American Neurological Association, Atlantic City, N. J., June 9-11. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., May 29-June 1. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Toronto, Canada, June 9-12. Dr. Charles W. Peabody, 474 Fisher Bldg., Detroit, Secretary.

American Otological Society, Atlantic City, N. J., May 26-28. Dr. Isidore Friesner, 36 East 73d St., New York, Secretary.

American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.

American Proctologic Society, Cleveland, June 1-3. Dr. William H. Daniel, 1930 Wilshire Blvd., Los Angeles, Secretary.

American Radium Society, Cleveland, June 2-3. Dr. William E. Costolow, 1407 South Hope St., Los Angeles, Secretary.

American Rheumatism Association, Cleveland, June 2. Dr. A. R. Shands, Dupont Institute, Wilmington, Del., Secretary.

American Society of Clinical Pathologists, Cleveland, May 29-June 2. Dr. A. S. Giordano, 531 North Main St., South Bend, Ind., Secretary.

American Therapeutic Society, Cleveland, May 30-31. Dr. Oscar B. Hunter, 1835 Eye St. N.W., Washington, D. C., Secretary.

Association for Research in Ophthalmology, Cleveland, June 3. Dr. Conrad Berens, 35 East 70th Street, New York, Secretary.

Idaho State Medical Association, Sun Valley, June 18-21. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.

Maine Medical Association, York Harbor, June 22-24. Dr. Frederick R. Carter, 22 Arsenal St., Portland, Secretary.

Medical Library Association, Ann Arbor, Mich., May 29-31. Miss Anna C. Holt, 25 Shattuck St., Boston, Secretary.

Minnesota State Medical Association, St. Paul, May 26-28. Dr. B. B. Souster, 493 Lowry Medical Arts Bldg., St. Paul, Secretary.

Montana Medical Association of Great Falls, June 24-26. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.

New Mexico Medical Society, Raton, May 26-28. Dr. L. B. Cohenour, 219 West Central Ave., Albuquerque, Secretary.

Ohio State Medical Association, Cleveland, June 3. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.

Pacific Coast Oto-Ophthalmological Society, Los Angeles, May 26-29. Dr. C. Allen Dickey, 450 Sutter Street, San Francisco, Secretary.

Pacific Northwest Medical Association, Spokane, Wash., June 23-28. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.

Rhode Island Medical Society, Providence, May 28-29. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.

Society of Surgeons of New Jersey, Plainfield, May 28. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

Utah State Medical Association, Salt Lake City, June 12-14. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

*Thirteenth Annual Meeting, Held in Chicago, Nov. 1 and 2, 1940*

The President, DR. CHARLES A. DOAN, Columbus, Ohio,  
in the Chair

### Effect of Heat and Cold on Gastric and Intestinal Motor and Secretory Activity

DR. J. DEWEY BISGARD, Omaha: In a series of patients kymographic records were made of gastric and intestinal tonus and peristalsis in response to the application of hot and cold packs to the abdominal wall and to the ingestion of hot and cold water. The motor activity was registered on indwelling inflated balloons connected to Miller-Abbott tubes. Records of the large intestine were obtained by threading balloons into the colon through colostomy openings. Applied externally, cold increased peristalsis and tonus of the stomach and bowel and caused a sharp rise in gastric acidity. Cold applied internally, by drinking ice water, produced the reverse effect. Heat applied externally decreased tonus and peristalsis, but when applied internally by drinking hot water it increased tonus and peristalsis.

### Effect of Histaminase on Secretion and Motility of the Stomach

DR. HEINRICH NECHELES, Chicago: Experiments were performed on dogs with Pavlov pouches or with gastrotomies in which secretion was provoked by meals of meat or motility induced by injection of prostigmine methylsulfate. After control experiments histaminase was administered by injection or orally before and at varying intervals during the course of the experiment. Inhibition of secretion and motility was observed in some instances, while in the greater number of experiments no effect was noted. The inhibitory effect of histaminase does not seem to be a specific one due to destruction of histamine by that ferment, and the experimental data are interpreted to show that the occasional inhibitory effect is due to a nonspecific protein reaction.

### Experimentally Produced Liver Damage and Gastric Acidity

DR. M. H. STREICHER, Chicago: The gastric juice obtained from dogs with Pavlov pouches by stimulation with histamine was studied before and after liver damage. The free and total acidities, the hydrogen ion concentration, the total base and chlorides were determined. The changes in blood proteins, non-protein nitrogen and the icterus index were observed. The gross and microscopic changes in the liver were studied.

Liver damage was produced in dogs by: (a) High voltage irradiation of the liver directly exposed at various intervals over a period of three years. The abdomen of each dog was opened under anesthesia with pentobarbital sodium, the viscera were blocked off from the liver by lead plates and the liver was exposed to forty-two minutes of high voltage radiation or the equivalent of three times the human cutaneous erythema dose. Each dog received 150 roentgens each minute for forty-two minutes. (b) Intragastric administration of carbon tetrachloride (1 cc. per 7 pounds [3.2 Kg.] given three times weekly) over a period of two to three years.

There was evidence that a disturbance occurred in the acid secretory mechanism of the stomach secondary to moderate or severe liver damage. Progressive liver damage depressed the acidity of the gastric juice. The gastric juice obtained (in this experiment) from the Pavlov pouch was apparently highly buffered. An attempt was made to study the nature of the buffers. Definite microscopic changes were noted in the livers of dogs exposed to radiation.

### Acid-Base Equilibrium and Renal Function During Hypochloremia

DR. JOSEPH B. KIRSNER and KATHRYN KNOWLTON, Ph.D., Chicago: The relationship of hypochloremia to the rise in blood nonprotein nitrogen observed in pyloric stenosis and intestinal obstruction has long been a subject of interest. Experiments were conducted in dogs in which severe hypochloremia was induced by the intermittent removal of gastric contents through a gastric cannula. Dehydration was combated by the use of adequate quantities of chloride free water. The effects of this hypochloremia on the acid-base equilibrium were studied in detail. Urea clearance studies were carried out on 1 dog. The results indicate that severe hypochloremia is not followed by an appreciable rise in the blood urea nitrogen when large amounts of fluid are ingested. The renal function remained normal throughout, despite the reduction in blood chlorides.

### Site of Absorption of Iron from the Gastro-intestinal Tract

DR. WILLIAM R. ARROWSMITH and VIRGINIA MINNICH, M.S., St. Louis: The intestinal tract of patients was obstructed at various levels by inflating a balloon attached to one of the openings on a Miller-Abbott double lumen tube. Soluble ferrous salts (4 mg. of elemental iron per kilogram of body weight) were given parenterally through the tube either proximal or distal to the obstruction; serum iron values were determined at intervals of about one hour during the subsequent six hour period. The data accumulated indicate that absorption occurs most readily in the stomach and duodenum, to a smaller degree in the jejunum and to an even lesser extent in the ileum. No satisfactory method has been devised for differentiating between absorption of iron from the stomach and the duodenum in patients. No evidence of absorption was noted when iron salts were given rectally.

### DISCUSSION

DR. A. C. IVY, Chicago: The type of response obtained in experiments on the effect of hot and cold drinks on the rate of gastric evacuation is apparently not uniform and appears to be dependent on the state of tonus and motility of the portion of the alimentary tract being studied when the stimulus is being applied. If cold water inhibits gastric motility, regardless of its effect on the pyloric sphincter, the rate of evacuation of the stomach would be decreased, because, whether or not the stomach ejects material into the duodenum depends on the relationship of the pressure in the stomach to the pressure in the duodenum. If it is less in the stomach than in the duodenum

nothing will flow from the stomach. Dr. Todd's results on the effect of cold fluids on gastric evacuation could be explained by an increase in tonus of the stomach. In view of the contradictory results in the literature regarding the effect of hot and cold applications to the abdomen, I teach that the comfort of the patient should determine whether hot or cold applications are best. Few of the articles on histaminase report the use of adequate controls; the investigators have not inactivated the histaminase preparation or injected parenterally or into the duodenum the heat-inactivated material. When we try to ascertain if an enzyme is producing certain phenomena we always inactivate that enzyme with heat as a control. Research in this field is characterized by a failure to perform control tests with heat-inactivated material. Some investigators believe that bile salts may play a role in the absorption of iron from the intestine. I should be interested in seeing Dr. Arrowsmith go further in his well planned experiment and introduce iron into the ileum with bile salts to ascertain if the serum iron level might not be increased.

DR. WALTER L. PALMER, Chicago: Dr. Klein, working in our laboratories, has used what we consider to be large doses of histaminase—20 units given intravenously—and found a 50 per cent decrease in the volume of secretion of histamine without any effect on free acidity. It should be noted that animals were not made ill by this large dose of histaminase. Dr. Kirsner's study represents one aspect of a larger problem, i. e., the mechanism of alkalosis. His observation on the alkalosis of experimental hypochloremia is in accord with other observations he has made, namely that the major factor in alkalosis of any type is not renal injury but loss of chlorides and dehydration. Of interest is the fact that gastric secretion in patients with severe hypochloremia is not materially impaired.

DR. GRACE M. RORR, Rochester, Minn.: Dr. Horton and I obtained the greatest inhibition of the rise in gastric acidity by introduction of a specially prepared histaminase into the duodenum of normal trained human subjects thirty minutes before they were immersed in cold water or given histamine subcutaneously. One should bear in mind the fact that it is not always easy to compare the results which are seen in human beings and those observed in animals with Pavlov pouches. Since Dr. Ivy suggested the inactivation of the histaminase for better controlled experiments, we again repeated some of these observations this summer, using the same material which had been effective the year before. The observations were made with subcutaneous injections of 0.1 mg. of histamine. The first portion was introduced into the duodenum before the injection of histamine into the normal human subject, and the histaminase again produced an almost complete inhibition of the rise in gastric acidity expected from the injection of histamine. Some days later, when another portion was filtered and introduced into the duodenum as before, there was a moderate rise in gastric acidity from the injection of histamine. When the remaining portions were boiled on a water bath five and ten minutes respectively and introduced into the duodenum, the rise in gastric acidity was nearly that produced by the injection of histamine; when the boiled portions were filtered and introduced into the duodenum, the rise in gastric acidity was the same as that produced by the control injection of histamine alone.

DR. HOWARD L. ALT, Chicago: I have seen a number of patients with iron deficiency anemia who responded poorly or not at all to enteric coated ferrous sulfate. One patient who had had a gastric resection received 0.4 Gm. of enteric coated ferrous sulfate three times a day for six months with no response in the hemoglobin. When half the dose of ferrous sulfate was given in a syrup solution, the hemoglobin responded in the usual manner.

DR. J. DEWEY BISGARD, Omaha: Before starting this work we were aware, of course, of the various factors that influence motor activity, such as psychic and emotional factors, the contents of the stomach at the time of observation and the like. In an effort to control these factors all studies were done on the fasting stomach and were carried out only after conditioning the patients to the experimental procedure by repeated introductions of the Miller-Abbott tubes. The records did vary a good deal, but still there was a definite and consistent pattern. Among

experimental factors which may influence results and account for discrepancies is the thickness of the abdominal wall, as shown by a Japanese investigator. Working with rabbits, in which the wall of the stomach is near the surface, he showed that after the application of ice to the abdominal wall there was a decrease in peristaltic activity if the ice remained for some time, but when a small screen was placed between the skin and the ice so that there was less opportunity for rapid conduction of heat and therefore no chilling of the gastric wall there resulted an increase in peristaltic activity. Of course, the contents of the stomach make considerable difference in the response. Todd has shown that when milk and water enter the stomach at the same temperatures they cause entirely different peristaltic responses.

DR. HEINRICH NECHELES, Chicago: I used insulin or prostigmine methylsulfate to stimulate gastric motility. Histaminase was given intravenously, subcutaneously or into the stomach, and, as a control, only saline solution was given in the same volume as the histaminase solution. There was only one experiment in which suppression of gastric motility occurred, lasting for twenty-three minutes and then returning to normal. The same preparation used on another dog gave no response. There were toxic effects from certain preparations when given intravenously, intramuscularly or subcutaneously, as evidenced by a considerable and often prolonged drop of blood pressure. I did not do inactivation of the enzyme with heat for the following reason: I was trying to find a preparation of histaminase with a constant stimulating or depressing effect. I could not. Practically every tablet or ampule varied in effect. Since this made proper controls impossible, I did not inactivate the material. I believe we have definitely shown that the available commercial preparation of histaminase is inconstant in its biologic effects and that it may stimulate certain sections of the gastrointestinal tract. In studying the clinical reports we have been struck by the fact that histaminase was least effective in those conditions for which a histamine-like substance is believed to be responsible. In other words, it seems that the effect of histaminase is not due to its enzyme content but to some impurities.

DR. JOSEPH B. KIRSNER, Chicago: Can dehydration be prevented by the administration of water alone in a patient with severe hypochloremia? I think not, because the body will not retain water when the chlorides are decreased. Furthermore, one cannot rely on clinical signs such as the urinary output to determine the presence or absence of dehydration. In one study done by McCance in which chloride deficiency was produced by diet and sweating, the body fluids were depleted by 38 per cent and the blood urea nitrogen rose to high levels. We have an experiment in man now in progress in which we are attempting to produce gradual depletion of chlorides and at the same time maintain an adequate intake of fluids with intravenous injections of dextrose and distilled water. It is too early to give the results, but the indications are that there will be no great rise in the blood urea nitrogen level if the depletion of chlorides is gradual. The removal of chloride by the Wangenstein tube is a rapid process. In the present study the gastric juice was removed for a period of only three hours each day. I think that, if similar conditions can be accomplished in man, a rise in blood urea nitrogen may occur but never to the extent of such high values as 100 to 125 mg. per hundred cubic centimeters.

#### Effect of Occlusion of Ureter on Experimental Hypertension

DRS. HARRY GOLDBLATT and JOSEPH R. KAHN, Cleveland: In 40 dogs, constriction of the main renal artery of one kidney was followed, almost invariably, by significant elevation of the systemic blood pressure which usually lasted two to six weeks. In 20 dogs in which one main renal artery was constricted and the ureter of the same kidney occluded, there was no elevation of blood pressure during a period of four weeks following the operation. In 5 animals with hypertension due to unilateral renal ischemia, occlusion of the ureter of the ischemic kidney caused the blood pressure to fall. These observations have special significance in cases of human hypertension associated with unilateral renal disease. Unilateral

nephrectomy may not be followed by a fall of blood pressure in such cases if the ureter is completely obstructed and the blood vessels are diseased.

#### A Substance in Kidneys Which Lowers Arterial Pressure in Hypertension

DRS. I. H. PAGE, O. M. HELMER, PH.D., K. G. KOHLSTAEDT, P. J. FOURS and G. F. KEMPF, Indianapolis: Harrison, Grollman and Williams and our group have come to the conclusion that normal kidneys contain a substance which reduces arterial pressure in both animals with experimental hypertension and in human hypertensive subjects. This substance has been extracted, and methods will be described for its preparation. When it is injected into hypertensive dogs and rats, the blood pressure falls little during the first days, but as the daily injections are continued the fall is accelerated. Usually after about five days the pressure may be at or near normal. If the blood pressure falls too rapidly the level of urea nitrogen in the blood may rise.

When the injections are discontinued, the arterial pressure slowly rises but may not regain its former level in some animals for many days or weeks. Many animals in which the malignant syndrome has appeared have been successfully treated.

Fourteen patients, 5 of whom exhibited the malignant syndrome, have been treated. Arterial pressure has fallen to levels near normal, and, when the injections have been received regularly, the lowered pressure has been maintained. Clinically the patients appeared improved.

#### Factors Contributing to the Development of Hypertension in Patients Suffering from Renal Disease

DRS. EDGAR A. HINES JR. and HOWARD H. LANDER, Rochester, Minn.: This article was published in *THE JOURNAL*, March 15, page 1050.

#### Response of the Blood Pressure to the Cold Pressor Test in Addison's Disease During Treatment with Desoxycorticosterone Acetate

GRACE M. ROTH, PH.D. and DRS. FRANCIS J. ROBINSON and RUSSELL M. WILDER, Rochester, Minn.: In the subjects of the present report, namely 10 patients with Addison's disease who were treated with desoxycorticosterone acetate, the response of the systolic and diastolic blood pressure to the cold pressor test and postural changes was studied. The period of treatment extended from thirteen days to nine months. Subcutaneous injections of desoxycorticosterone acetate ranging from 2.5 to 5 mg. daily were given, and in each of 2 patients implantations were made of 400 mg. In all 10 patients the levels of both the systolic and diastolic blood pressure were increased as well as the response to the cold pressor test. The increase of the systolic and diastolic blood pressure in response to the cold pressor test was striking and became greater as treatment was prolonged.

#### DISCUSSION

DR. ALF S. ALVING, Chicago: Two reasons based on experimental work may be advanced for sympathectomy in hypertensive patients. First, based on Dr. Goldblatt's work, it has been postulated by some who have advocated partial sympathectomy or splanchnicectomy that these procedures might result in an increased flow of blood through the kidney by relieving spasm of the arterioles of the kidney. Secondly, some investigators have experimentally produced neurogenic hypertension by sectioning the carotid sinus and modulator nerves; this hypertension can be relieved completely only by total sympathectomy. With these observations in mind we felt that the neurogenic factors in human hypertension could possibly be abolished and the disease benefited by total bilateral paravertebral sympathectomy. We have operated on seven patients. For our first subjects we chose patients with severe and almost hopeless hypertension. One, whose condition before operation was desperate, died two days after operation. Five have had a substantial reduction in blood pressure. None have been under observation longer than five months, so that we do not know whether or not any of the results are permanent. One patient has no reduction of blood pressure while she lies down, but in the erect position her blood pressure falls to 120 systolic and 80 diastolic.

#### Donated by.

All these patients have some degree of postural hypotension and, for a month or so, have suffered from dizziness and fainting. In 1 patient we have evidence that a relaxation of the efferent arterioles occurred, as indicated by a significant diminution in the fraction of plasma water filtered and an increased flow of blood through the kidney. In 4 other patients there occurred either a diminution of renal blood flow after operation or no significant change in blood flow, as measured by the method of Dr. Homer Smith and his co-workers. It is obvious, therefore, from these studies that such a fall in blood pressure as occurs from operating on the sympathetic nervous system for hypertension is not necessarily accompanied by an increase in the flow of blood through the kidneys. We have found neither the cold pressor test nor the use of sodium amylal of value in predicting the postoperative results so far.

DR. EDGAR V. ALLEN, Rochester, Minn.: There are some questions for Dr. Page and his co-workers: Is this extract specific; that is, are the kidneys the only tissue whose extract favorably influences blood pressure; has he used as controls extracts made in a similar way of the spleen, muscles, liver and other tissues? The second question is relative to the possible bad side effects of repeated injections of renal extract. The third question is relative to whether or not the effect of treatment of the patient with renal extract is more beneficial than the use of some other substance, especially the use of potassium thiocyanate, which in many instances relieves the symptoms and reduces blood pressure. The fourth question is relative to the time at which it may be expected that this extract will be available for general clinical use.

DR. PAUL STARR, Chicago: Is there any evidence that the patients may become immune to the antipressor substances?

DR. EMMET B. BAY, Chicago: Is there any evidence of improvement in renal function in those cases of malignant hypertension in which Dr. Page used the extract?

DR. A. C. CORCORAN, Indianapolis: An example of the results in human beings suffering from hypertension is provided by the last patient discussed by Dr. Page, a patient with malignant hypertension in whom, under treatment, systolic pressure had decreased from 260 to 160 mm. of mercury. The renal blood flow on three occasions before treatment averaged about 140 cc. a minute, and the filtration fraction was approximately 0.2. Under treatment with extract, the filtration fraction fell to 0.17 and to 0.12 and is now about 0.16, while renal blood flow increased to 170 and 250 and is now maintained at about 225 cc. a minute. In another case of malignant hypertension, the filtration fraction was 0.34 in control observations and fell to 0.20 with treatment, while the renal blood flow at first fell from 450 cc. to about 350 cc. and is now about 450 cc. a minute. The filtration fraction is a measure of the fraction of plasma water removed by filtration under intraglomerular pressure. The reduction of the filtration fraction with a tendency to increased flow of blood in spite of decreased systemic pressure in these cases can be attributed only to relaxation of constricted glomerular efferent arterioles. The renal changes in patients with essential hypertension and in dogs with experimental hypertension are similar. On one occasion we injected into a normal dog renal extract equivalent to 1,500 Gm. of renal tissue. The renal blood flow doubled in the twenty-four hours after injection, while the filtration fraction fell from 0.28 to 0.15. Blood pressure fell slightly from 130 to 85 mm. of mercury. There were no untoward symptoms or pyrogenic reaction. The effect of these extracts on the kidney seems to be due to neutralization of the humoral renal pressor system.

DR. LOUIS N. KATZ, Chicago: That the kidney plays a specific role in neutralizing renal hypertension is suggested by the fact obtained in our laboratory that transplanting a kidney into hypertensive dogs and permitting it to necrose led to a drop in blood pressure to normal levels which, in some instances, outlasted the disappearance of the kidney for as long as several weeks. This result could not be obtained with transplantation of any other tissue we have used. It is not a nonspecific depressor action because transplanting kidneys into dogs with normal blood pressure has no effect. I did not hear Drs. Goldblatt and Kahn explain why ligation of the ureter of the



ischemic kidney caused the blood pressure to drop when a normal kidney was also present. On the basis of my results which show that the normal kidney tends to neutralize hypertension, is it not possible that the ureteral ligation, by stopping the activity of that kidney, causes the activity of the contralateral kidney to increase and thereby augments the latter's ability to neutralize hypertension?

DR. HEINRICH NEEHELES, Chicago: I have observed dogs with essential hypertension. When these animals were put into shock and then infused with dog serum their hypertension returned, while in similar experiments on previously normal dogs the blood pressure could be brought beyond the shock level but not above the preshock level. The same has been seen in a few patients with hypertension who went into shock for one reason or another and were infused with pooled human serum; when they came out of shock their hypertension reappeared.

DR. GEORGE E. WAKERLIN, Chicago: Unquestionably, the amount of collateral circulation to the kidney is an important factor in determining the degree and persistence of the experimental hypertension. However, observations indicate that this is not the sole explanation, and I am inclined to the belief that extrarenal factors influence the character of the hypertension in the face of the same amount of renal ischemia. Most probably these extrarenal factors in the hypertensive dog are the same as those in the cases which Drs. Hines and Lander have discussed.

DR. HARRY GOLDBLATT, Cleveland: In answer to Dr. Katz, Dr. Kahn and I thought we had referred to the probable part played by the normal kidney in neutralizing or inhibiting the hypertensive effect of unilateral renal ischemia. We did not stress it because we do not know exactly how it acts. Whether this is the only mechanism involved when the artery is constricted and the ureter is occluded, and just exactly how it acts in these circumstances, we cannot state. We have suggested that an additional factor may be the failure of the hypothetic effective pressor substance to enter the systemic circulation in sufficient quantity to affect the blood pressure. We have repeated the work of Dr. Katz and his collaborators on the effect of the implantation of pieces of normal kidney under the skin of dogs with experimental hypertension due to renal ischemia. For our tests we used 7 animals which had had hypertension for years, the same number of animals used by Dr. Katz and his collaborators. Instead of using only 10 Gm. of tissue, as they did, we used as much as 30 Gm. Although they reported a fall in blood pressure in most of their animals, we found no significant effect on the blood pressure as a result of this procedure. As a possible explanation for the difference, we suggest the fact that in none of our animals did the wound open or break down or the liquefied material run out, whereas they reported that this almost invariably happened. It is probable that infection played a part or that hypertension had not yet become well established in their animals at the time of the test.

NOTE: Since making this comment at the meeting, we have performed 12 more subcutaneous implantations of renal tissue into hypertensive animals. In only 1 out of the 12 was there any effect. On the second day after the operation there was a large fluctuating mass at the site of the implantation. This was opened and proved to be an abscess. Within seventy-two hours after the evacuation of the pus the blood pressure had returned to its original high level.

DR. I. H. PAGE, Indianapolis: Only a few facts are known about the mechanism of action of this inhibitor substance, but these are not sufficient to enable one to decide whether the substance acts specifically to inhibit the autonomic vasopressor system. The kidneys seem to be the chief source of it in the body. Some appears to be contained in muscle but a good deal less than in the kidneys. We cannot answer the question whether there are bad side effects. Local and sometimes febrile reactions occur, not unusually after injection of the material in some patients. We have not observed the type of vascular change observed by Winternitz in his studies on the production of hemorrhagic arteriolar necrosis. It will be recalled that

he used the so-called fraction D of Helmer and Page as the starting point for the preparation of his necrotizing substance and that the pressor and necrotizing materials tend to follow one another during fractionation. The effects of the inhibitor on arterial pressure in human beings seems to be more profound than those of potassium thiocyanate. That is to say, the blood pressure can be depressed to a greater degree. The clinical results in malignant hypertension are also more impressive. I do not intend to convey that I think thiocyanate of no value when employed by the method recommended by Barker. One can appreciate that 1,000 Gm. or more of whole kidney is a large amount. Experience has shown that the yields can usually be improved, and that is one of the problems which is facing us at present, and that and the problem of converting a laboratory to a plant scale operation. I regret that I cannot tell you when this substance will be available for general clinical testing, and certainly until it has received that examination it cannot be accepted as a therapeutic agent. We have so far not seen any development of immunity. Somewhat against the idea is the fact that we are able to use our hypertensive dogs and rats over and over again in most cases without their becoming resistant to active extracts. The blood pressure in both malignant and essential hypertension is reduced by the extract, but the results in malignant hypertension are more dramatic, I suppose, because the symptoms and signs are more dramatic to start with. I described the partial restoration of vision, which is naturally impressive. Dr. Neeheles asks whether a renin activator persists in the blood for any length of time. We have used plasma kept in the refrigerator for two to three days after being drawn without observing any noticeable decline in the activator content, but beyond that I do not know.

DR. EDGAR A. HINES JR., Rochester, Minn.: In a group of approximately 1,800 patients, with or without nrologic disease, who returned to the clinic after twenty years, 45 per cent of those who gave a history of hypertension in one parent on their first visit had hypertension twenty years later, and 90 per cent of those who gave a history that both parents had hypertension showed hypertension twenty years later. Dr. Roth has shown a reproduction over a short period of time of what I have observed over a period of ten years in a group of persons who were originally hyperreactors and who eventually incurred clinical essential hypertension. These patients show increased hyperreactivity to the cold pressor test and more sustained high levels of blood pressure and hypertensive changes in the ocular fundi. With one exception, desoxycorticosterone acetate is the only substance that I know of which has been demonstrated to produce an increase in vascular hyperreactivity as measured by the cold pressor test. The single exception is the intravenous injection of calcium chloride. I call attention to this because there may be a relationship between inorganic ion balance and vascular hyperreactivity. I hope Dr. Roth and her associates will be able to elucidate the mechanism which produced the increase in vascular hyperreactivity in their patients because in it may be a clue to some of the things we do not understand concerning control of the circulation and blood pressure.

DR. GRACE M. ROTH, Rochester, Minn.: We did not have cold tests on these patients before they had Addison's disease. We have used this substance only a short time, and in many instances, but not in all, in which the blood pressure was elevated the clinical condition of the patient was improved. Furthermore, the number of patients we have observed has been small. We should like to call attention to the fact that by means of this crystalline substance high levels of blood pressure developed in patients who had previously had low blood pressure readings. Since this has occurred repeatedly and has been sustained over a period of nine months, it might be well in the treatment of patients with Addison's disease to keep in mind the possibility of the development of hypertension with more prolonged therapy.

#### Capillary Circulation in the Malarial Infected Monkey—A Cinematographic Study

MELVIN H. KNISELY, PH.D.; DR. WARREN K. STRATMAN-THOMAS and THEODORE S. ELIOT, PH.D., Chicago and Memphis, Tenn.: By transillumination with a quartz rod, arterioles, capillaries, sinusoids and venules have been studied in the *emulm*,



mesentery, striated and smooth muscle, intestinal villi, dura mater, pia mater, cerebral cortical surface, liver, lung, adrenal glands and spleen of "normal" amphibians and mammals.

Vessels of those organs in italics were studied in 5 *Macacus rhesus* monkeys infected with *P. knowlsi*. Pentobarbital sodium was the anesthetic used.

In normal animals (1) there is a normal rate of blood flow in the capillaries of each tissue for each physiologic state of the animal; (2) in arterioles and venules the flow is in concentric cylinders—streamlined; (3) most leukocytes are swept along in flowing blood; occasionally one rolls along endothelium; (4) normal erythrocytes are not fibrin coated, do not stick together or to endothelium and are not phagocytized in the spleen or liver.

A layer of fibrin or a fibrin-like substance is precipitated on knowlsi-parasitized erythrocytes. Coated erythrocytes do not stick to ordinary endothelium but do stick to one another, forming "clumps" which stick to and are instantly engulfed by hepatic phagocytes. Later, plasma viscosity increases, and phagocytosis of clumps slows down or may stop. Small clumps unite forming larger ones. Clumps and viscous plasma destroy streamline flows, increase the heart's work, reduce flow rates in all tissues below normal values.

Ordinary endothelium becomes sticky to solidly coated with leukocytes. Hence "leukopenia" in drawn blood. Terminal symptoms are manifestations of damage resulting from greatly slowed capillary circulation rates.

#### Etiology of the So-Called Side-Ache That Occurs in Normal Persons

DR. RICHARD B. CAPPS, Chicago: In spite of the frequent occurrence of side-ache little information is available concerning its characteristics or origin. This report is based on a study of 114 personally observed attacks in 55 different persons. The outstanding characteristics were found to be a constant relation to exertion, tendency to occur after eating and in cold weather, variable location in either the right or left upper quadrant and relief from bending over or local pressure. Previously proposed theories of origin are shown to be untenable. A new explanation is suggested that satisfies all requirements, namely, anoxemia of the diaphragmatic muscle.

#### Asymmetrical Cutaneous Lesions in Pellagra

DRS. WILLIAM BENNETT BEAN, RICHARD W. VILTER and TOM D. SPIES, Cincinnati: Fifteen pellagrins with an atypical distribution of their dermatitis were observed in the nutrition clinic at Birmingham, Ala., during the spring and summer of 1940. These included examples of unilateral lesions or those with marked asymmetry. In all but 2 of these patients we found disturbances which led to a decrease in the blood supply to the tissues involved or to an increase in local metabolism. These cases throw light on the nature of the underlying pathogenesis and are in agreement with the concept of a defect in cellular respiration.

#### Pantothenic Acid in Human Nutrition

HAROLD KRAHNKE, B.S., and DR. EDGAR S. GORDON, Madison, Wis.: Using the bacteriologic method of assay for pantothenic acid developed by Strong and his associates, we have studied the normal excretion rate in 12 healthy young medical students and found it to vary between 2.1 and 7.2 mg. daily with an average figure of 3.7 mg. In addition, responses to test doses of 10 mg. administered both by mouth and subcutaneously were studied, and the results, although too few to be conclusive, nevertheless justify the hope that a diagnostic test of deficiency may be developed on this basis. The role of pantothenic acid in both nervous and endocrine disorders was discussed with especial reference to the deficiency lesions of a degenerative nature in the brain and spinal cord in animals, and the adrenal cortical necrosis with hemorrhage which has been described in rats.

#### DISCUSSION

DR. TOM SPIES, Cincinnati: I admire the accuracy of this method but I do not think it can be applied by the practicing physician. Pantothenic acid was so named because it was presumed to be present everywhere. Apparently it is present in most foods. Nevertheless, in persons who have a nutritional

deficiency such as beriberi the blood level of pantothenic acid is only 50 per cent of that found in normal persons. We believe, therefore, that there is such a thing as a pantothenic acid deficiency in man even though we have not found any clinical sign pointing to a deficiency of this substance.

#### Effect of Depriving the Infant of Its Placental Blood During the First Week of Life

Q. B. DE MARSH, M.S.; W. F. WINDLE, PH.D., and DR. HOWARD L. ALT, Chicago: Infants whose umbilical cords were clamped immediately after birth had an average of 0.56 million fewer red cells per cubic millimeter and 2.6 Gm. less hemoglobin per hundred cubic centimeters during the first week of life than infants whose cords were not clamped until the placenta had separated from the uterus. Erythrocyte and hemoglobin values in infants within an hour after birth were much higher than in blood from the cord. Reticulocytosis during the first week of life was appreciably higher when the cord was clamped immediately than when clamping was delayed. Depriving the newborn infant of its placental blood by early clamping of the cord is equivalent to submitting the infant to a hemorrhage.

#### Storage and Transportation of Blood for Military Purposes

DRS. ELMER L. DEGOWIN, ROBERT C. HARDIN and E. D. PLASS, Iowa City: Sturdy, rubber-sealed transfusion flasks in commercial production were adapted to be almost completely filled with a blood-dextrose-citrate mixture, thus minimizing trauma to the erythrocytes. Flasks of blood were packed in ice and shipped by transport plane from Iowa City to Oakland, Calif., and return via United Air Lines (a distance of 3,539 miles). In bloods shipped, both fresh and after storage for fourteen days, the plasma hemoglobin increased only a few milligrams per hundred cubic centimeters. The blood mixtures were later transfused without untoward reactions. Similar experiments were performed in shipping bloods approximately 500 miles by hospital ambulances. It was found practical to pack ten flasks of blood and the necessary ice in 10 gallon milk cans surrounded by commercial insulating covers. This obviates the production of special equipment in a national emergency. An inexpensive, easily constructed refrigeration indicator was devised to be attached to each flask. The transfusion of dextrose-citrate plasma aspirated from stored blood produced recovery from surgical shock in patients.

#### DISCUSSION

DR. O. H. ROBERTSON, Chicago: My information on the transportation of preserved blood during the last world war was limited to the effect of carrying a few bottles by ambulance up to the advanced dressing stations. These bottles got a good deal of bumping, but the results of transfusion, given frequently by candle light in dugouts, were excellent. Of course it was not possible to follow the patients in most instances, but I suspect, in view of the authors' results, that reactions seldom occurred. One more point: transfusions of whole blood should not be discarded in favor of transfusions of plasma. There has been too much publicity on plasma transfusions, and although I realize the importance of plasma in temporary emergencies I still feel that in patients with grave exsanguination there is nothing that takes the place of the red blood cells. It was observed during the last war that the fluids of the blood could be restored with various substances, but, while the patients recovered so far as shock was concerned, secondary infection, if present, often persisted for a long time and was probably related to the low concentration of red blood cells present. Patients given transfusions of whole blood seemed to get along much better.

DR. MAURICE HARDGROVE, Milwaukee: The advantages of both whole blood and plasma transfusions are realized, but it is only fair to say that there is a similar agent which has the same effect as plasma, and that is blood serum. The Canadians have used concentrated blood serum in sufficiently large quantities to be satisfied that it is of value in shock. All of us who have worked with serum or plasma have seen cases in which the immediate use of either agent has been of value while the physician is waiting for a suitable donor for a transfusion of whole blood. Is there any reason why plasma should be superior to serum in the treatment of shock?

DR. WALTER M. SIMPSON, Dayton, Ohio: I should like to ask whether any experimental work has been done on the preservation of blood or serum or plasma in tin cans. I believe that such a cheap and simple method would be feasible. As regards the shipping of blood or serum or plasma, it would be a simple undertaking for those engaged in refrigeration research to develop a refrigerated truck in which the temperature could be kept at a constant level for the transportation of these materials for military use.

DR. HEINRICH NECHELES, Chicago: I should like to enter a plea for the use of serum instead of plasma. I have found that plasma with sodium citrate soon shows precipitates, and on standing for a few weeks or months the plasma is serum, i. e., plasma out of which the fibrin has precipitated and which is diluted with sodium citrate. I feel, therefore, that for emergencies or for shipment abroad it would be much simpler to use serum to begin with. This process of precipitation can be prolonged if the plasma is kept cold. With serum this is not necessary. If it is prepared adequately it can be kept at room temperature for indefinite periods and still will be clear. The question also comes up whether, when the plasma shows precipitate, this may not be due to contamination rather than to the precipitation of fibrinogen. I would not trust such a solution unless I could make certain of that point. Furthermore, if transfusions of plasma are given I understand that a filter must be used, which complicates the procedure and adds to the expense. With serum this is not necessary. I wonder also whether, in cases of extreme shock, the introduction of relatively large amounts of sodium citrate may not have some bad effect.

DR. EDGAR A. HINES JR., Rochester, Minn.: There is a refrigerant powder recently placed on the market which, when dissolved in water, will reduce the temperature of the water to any desired degree near freezing. I have experimented with it to some extent in carrying out the cold pressor test and I have found that if the container is properly insulated the water can be kept at near freezing temperature for several hours.

DR. ELMER L. DEGOWIN, Iowa City, Iowa: I would rather not become involved in the discussion about the relative merits of serum and plasma. Many institutions have been working with serum for years and have had good success, but it means that certain expensive equipment must be installed to handle large volumes of blood, and many laboratories are not so equipped. I doubt that there are enough centrifuges in the country to carry out the preparation of the quantity of blood needed. We did not use tin cans in transportation of the blood. These glass flasks are inexpensive, and an attempt is being made to get their cost down to such a point that the whole equipment can be thrown away after it has been used. The appearance of precipitate in plasma is admitted, and every one who has worked with it has encountered that difficulty. However, it is not serious, and there is some question as to whether it would do any harm if the plasma was injected without being filtered. We have given it without filtration apparently without reactions. Another thing Dr. Necheles may have observed is that apparently this precipitate, the nature of which is not definitely settled, tends to disappear if the plasma is stored at room temperature. We do not know what chemical reaction is involved.

#### Determination of Bile Acids in Blood and Urine

J. L. IRVIN, PH.D., and Drs. C. G. JOHNSTON and E. A. SHARP, Detroit: Methods previously proposed for the determination of bile acids in blood did not eliminate error due to interfering substances. The procedure employed in this work provides for hydrolysis of whole blood in order to split the proteins and the conjugated bile acids. Cholic, desoxycholic and hyodesoxycholic acids have been determined in the whole blood and urine of normal human subjects and in cases of hemolytic anemia and polycythemia after the administration of soluble whole bile. The implication is that a procedure for the determination of bile acids in the blood in obstructive jaundice and in hemolytic phenomena should aid materially in the clinical investigation of these conditions.

#### DISCUSSION

DR. E. A. SHARP, Detroit: The implications of these studies are that the amount of cholic acid and other bile constituents found in hemolytic blood disorders is about one tenth to one

twentieth greater than the amount which will hemolyze normal cells in vitro. Therefore, the future of the experiment is to determine whether bile constituents in the peripheral blood will explain hemolysis and the hemolytic aspects of anemia.

#### The Cephalin-Cholesterol Flocculation Test in Hepatic Disease

DR. DAVID H. ROSENBERG, Chicago: The results of the cephalin-cholesterol flocculation test are reported for a group of 155 selected persons. The test gave positive results in all cases of unquestionable and suspected hepatic disease and agreed more closely with the clinical observations than with other laboratory data, including the bromsulphalein and the hippuric acid tests. In 43 out of 72 patients with unsuspected hepatic disease, flocculation tests indicated liver damage. More careful histories and reexaminations, supplemented by the bromsulphalein or the hippuric acid test, provided confirmation. The test ran parallel with the clinical improvement following treatment. It is concluded that the flocculation test is a sensitive test of liver damage, possessing prognostic value and useful in differentiating parenchymatous from obstructive jaundice. Data indicate that mild and subclinical chronic hepatitis occurs more frequently than is generally appreciated and, unless specifically sought, may elude recognition.

#### DISCUSSION

DR. FREDERICK J. POHLE, Madison, Wis.: My associates and I have examined serum from 284 normal persons and have yet to find a false positive reaction; we have examined 455 hospital patients without evidence of hepatic disease and found 3.3 per cent false positive reactions. In 23 cases of cirrhosis of the liver the test gave positive results in 100 per cent; in 52 jaundiced patients with hepatitis or focal hepatic lesions the test gave positive results in 95 per cent and in 25 cases of obstructive jaundice in 70 per cent. These were cases of complete obstruction with secondary disturbance of the liver. We agree that the flocculation test is a sensitive means of determining hepatic function. The only conclusion we could not draw is that it is of value in the differential diagnosis between hepatogenous and obstructive jaundice.

DR. DAVID H. ROSENBERG, Chicago: In cases of obstructive jaundice, a positive flocculation reaction depends entirely on the amount of associated damage to the liver. In this series, with the exception of a single instance of long-standing obstructive jaundice associated with advanced biliary cirrhosis, the flocculation tests, when they gave positive results, revealed only slight flocculations. Thus, in the early diagnosis of jaundice a negative or slight flocculation reaction may be regarded as indicative of the obstructive type.

#### Microcinematographic Studies of Responses of Reticuloendothelial Cells to a "Marked Antigen"

DR. BEN C. HOUGHTON, Columbus, Ohio: When a purified azo-egg albumin, a distinctly red dye antigen, was injected intravenously in experimental animals an important series of cytophysiologic changes was observed. The dye antigen was readily ingested by the macrophages of the tissues and other cells of the reticuloendothelial system. After a period of digestion and dissolution of the visible antigen, these cells appeared to respond by an increased budding and shedding of the colorless peripheral cytoplasm. This process seemed to precede the development of specific antibodies. The present report deals with an in vitro study of the phenomenon observed by Sabin. Splenic macrophage "elasmatoctes" were isolated in cultures and treated with varying concentrations of the azo-egg albumin antigen of Heidelberger. Time lapse motion pictures in color were taken daily during the experimental period. During the first three days, heavy concentrations of dye were observed in these cells, which became increasingly phagocytic. On the fifth day much of the dye had faded, and clear zones of peripheral cytoplasm began the process of budding. The colorless cytoplasm underwent separation and rapid dissolution. On the seventh and eighth days many large pale cells had reached a climax of this process and were to be seen surrounded by large areas of cytoplasmic fragments. Active motility had ceased, and the individual cells were surrounded by large groups of active small lymphocytes. This phenomenon appeared only in the treated cultures.

(To be continued)

## Current Medical Literature

### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Diseases of Children, Chicago

61:213-426 (Feb.) 1941

- Effect of Ultraviolet Irradiation of Air on Incidence of Infections in an Infants' Hospital. F. del Mundo, Boston, and C. F. McKhann, Ann Arbor, Mich.—p. 213.
- Coccarboxylase, Pyruvic Acid and Bisulfite-Binding Substances in Children. H. Worts, R. S. Goodhart and E. Bueding, New York.—p. 226.
- Coccarboxylase Content of Blood of Infants and of Children. F. W. Schlutz and Elizabeth M. Knott, Chicago.—p. 231.
- \*Infectious Mononucleosis Without Clinical Signs or Symptoms. Gertrude Meyersbach and T. F. Lenert, Irvington, N. Y.—p. 237.
- Lead Poisoning: Clinical and Experimental Study of Factors Influencing Seasonal Incidence in Children. M. Rapoport and M. I. Rubin, Philadelphia.—p. 245.
- Excretion of Mandelic Acid in Breast Milk. H. Berger, Staten Island, N. Y.—p. 256.
- Nasal Flora of Children in a Day Nursery. H. S. Yang, New Haven, Conn.—p. 262.
- Effect of Irradiation of Air in a Ward on Incidence of Infections of Respiratory Tract, with Note on Varicella. D. Greene, L. H. Barenberg and B. Greenberg, New York.—p. 273.
- Body Build Aspect of Immunity to Diphtheria. Helen B. Pryor, Stanford University, Calif.; Mary Schmeckebier and H. E. Thielander, San Francisco.—p. 276.
- \*So-Called Essential Hypertension in Childhood. I. P. Sobel, New York.—p. 280.
- Width-Weight Tables (Revised). Helen B. Pryor, Stanford University, Calif.—p. 300.
- \*Relation of Tonsillectomy and of Adenoidectomy to Incidence of Poliomyelitis, with Special Reference to Bulbar Form. A. E. Fischer, New York; M. Stillerman, Great Neck, N. Y., and H. H. Marks, New York.—p. 305.
- Infection Points in the Field of Behavior. J. S. Plant, Newark, N. J.—p. 347.
- Negativism: Its Treatment and Its Implications. J. S. Plant, Newark, N. J.—p. 358.

**Infectious Mononucleosis Without Clinical Signs.**—Reyersbach and Lenert report an outbreak of an atypical form of infectious mononucleosis in which clinical symptoms and signs were entirely lacking. The epidemic (16 cases) spread slowly through a sanatorium having 108 children with rheumatic fever who were receiving convalescent care. The disease was discovered accidentally during one of the routine leukocyte counts taken every three or four weeks. The 108 children (only 3 Negroes) had no contact with other children, and each was permitted only two adult visitors every six weeks. The infection was introduced by a white girl aged 6½ years, admitted on Oct. 10, 1939, who had leukocytosis. Physical examination on entry was negative. The child had undergone tonsillectomy on Sept. 25, 1939, and it was thought that the blood picture was a peculiar postoperative reaction. After a month the stationary leukocytosis decreased gradually, becoming normal by the end of November. On November 27 a routine blood count revealed a similar condition in a girl aged 12½ years; physical examination gave negative results. Her leukocyte count remained elevated for two weeks, then decreased gradually and was normal after one month. During the next six months the disease developed in 14 more patients and was discovered by routine leukocyte counts. None of these children had symptoms or fever. Physical examinations were entirely negative. The characteristic finding in all these cases was a striking rise in the total leukocyte count, varying from 59,300 to 18,400 cells per cubic millimeter. Differential counts showed that this rise was due to the marked increase in mononuclear cells. The lymphocytes rose to a maximum of 90 per cent and were never lower than 71 per cent at the height of the disease. There was a relative decrease in polymorphonuclear cells. The results of the Paul-Bunnell test were negative for all 16 patients. The epidemic differs from others in its low infectivity. Only 1 boy contracted the infection, and no other cases developed either in his dormitory or in his recreational group. In view of the

marked variation in susceptibility of the same child at different times, it was impossible to determine the incubation period. The interval between introduction and the appearance of the second case was approximately forty-eight days. If the disease developed in the third and fourth patients as a result of their exposure to the second patient, the incubation period was sixteen to seventeen days. However, at the end of the epidemic there again was evidence to indicate that the incubation period was forty days or longer. No evidence was obtained to indicate that the virulence of infections of the upper part of the respiratory tract or of rheumatic fever was enhanced by the agent of infectious mononucleosis. In spite of the absence of clinical symptoms and positive physical manifestations, the condition they believe should be classified as infectious mononucleosis because of the characteristic blood picture and the infectious nature of the epidemic.

**Essential Hypertension in Childhood.**—Sobel cites 7 cases of so-called essential hypertension in children between 4 and 12 years of age. The definition of essential hypertension given by Fishberg as chronically elevated blood pressure not evolved from antecedent renal inflammatory disease or urinary obstruction is further narrowed to exclude such obvious causes as adrenal cortical carcinoma, pituitary basophilism, hyperthyroidism, rheumatic fever and increased intracranial pressure. Essential hypertension will be regarded as renal but not as nephritic hypertension. Present experimental and pathologic data indicate that reduction of renal blood flow is the main initiating etiologic factor in producing so-called essential hypertension. In none of the 7 children has there been any evidence of cardiac enlargement, cardiac decompensation, thickening and sclerosis of the arteries of the extremities or diminution in renal function. Every child had had a tonsillectomy prior to the hypertension. In addition to the routine history, physical and fundoscopic examination, urinalysis and chemical blood determinations the minimal requirements for an adequate study of so-called essential hypertension in childhood are (1) blood pressure determinations of parents and relatives, (2) blood pressure determination of the lower extremities, (3) an intravenous urogram and possibly a retrograde pyelogram, (4) the Fishberg concentration test, (5) the Addis count, (6) a urea clearance test, (7) a teleroentgenogram of the chest, (8) an electrocardiogram, (9) a basal metabolism reading, (10) a perineal insufflation when indicated, (11) a determination of the response to sodium nitrite, sodium amylal and, if necessary, an intravenous injection of pentothal sodium, (12) consideration of the behavior of the blood pressure during sleep and (13) a study of the response to the cold pressor test. This routine is important for diagnosis, prognosis and treatment. Hypertension in the parents makes it much more likely that permanent hypertension will develop in the child sometime during its life. A child whose elevated blood pressure drops to a normal level but who reacts positively to the cold pressor test should be carefully watched for hypertension later in life. That such high blood pressures and elevations may occur temporarily during adolescence are normal and do not impair future health has yet to be proved. A recent follow-up study by Hines and Brown of an original group of apparently normal subjects studied with the cold pressor test disclosed that hypertension had developed in 38 per cent of the hyperreactors and in none of the normal reactors six years after the original study. Hyperreacting children (especially those with intermittent elevations) should be carefully watched for the development of permanent hypertension later in life. Intermittent excursions tend to become more frequent and denote incipient hypertension. With advancing years permanent hypertension, with its sequelae, may follow "harmless," transitory hypertension of childhood. Such elevations in a child or adult should no more be ignored than the intermittent excretion of sugar in the urine. As a working hypothesis the hypertensive state may be regarded as frequently having its origin in childhood.

**Tonsillectomy and Poliomyelitis.**—In trying to determine the relation of tonsillectomy and adenoidectomy to poliomyelitis Fischer and his co-workers studied the age, date of onset, type of poliomyelitis, presence or absence of tonsils, date of tonsillectomy and date of death of the 507 children from 3 to 12 years of age who were treated in Toronto during the 1937 epidemic

of poliomyelitis. Of the 507 children 231 had their tonsils and adenoids removed, the tonsils of 267 were still present and for 9 there were no data. There was no significant difference in the monthly incidence between the tonsillectomized and the non-tonsillectomized patients. There was an increase in cases in both groups during the last week in July when the epidemic began. Up to 6 years of age, children with intact tonsils were in the majority. After the age of 6, tonsillectomized children were in the majority. The bulbar form of poliomyelitis was significantly higher in the tonsillectomized (except in those who had their tonsils removed from two to six months before onset) than in the nontonsillectomized group, being 18.6 and 7.5 per cent, respectively. The nonparalytic form was slightly, but not significantly, greater in the group with tonsils. The difference in the proportion of the spinal forms was not significant. The major cause of death was respiratory failure resulting from involvement of the bulbar nuclei. The mortality (6.5 per cent) among the tonsillectomized children was higher than among the children with intact tonsils (1.5 per cent). Bulbar poliomyelitis was higher and the nonparalytic form lower among those tonsillectomized within a month of onset than among those operated on more than a month before the onset of poliomyelitis. Twelve cases in which poliomyelitis developed within a month of operation are reported. The poliomyelitis was bulbar in 7 of these cases. From information on the general incidence of tonsillectomy among school children it was possible to compute the incidence of poliomyelitis during the 1937 epidemic among recently tonsillectomized children. A higher incidence was observed among the recently tonsillectomized group than among other children. The frequent recent reports of the occurrence of poliomyelitis in recently tonsillectomized children supports this observation. The higher incidence of bulbar poliomyelitis among tonsillectomized children suggests the possibility that the tonsillopharyngeal area is one port of entry for the virus and that the tonsils and adenoids serve as a barrier. Therefore tonsillectomy and adenoidectomy had best be postponed while poliomyelitis is prevalent in a community.

### American Journal of Psychiatry, New York

97:753-1006 (Jan.) 1941

- Summary of 200 Neurologic and Psychiatric Admissions from the Canadian Army Service Forces. W. Baillic, Toronto.—p. 753.  
Present Day Trends in Neuropsychiatric Research; Round Table Discussion. S. B. Wortis, moderator, New York.—p. 780.  
Report of Progress in Developing a Mental Hygiene Component of a City Health District. P. Lemkau, C. Tietze and Marcia Cooper, Baltimore.—p. 805.  
Personality Disorders with Brain Tumors. M. Kanzer, New York.—p. 812.  
Evaluation of Manic-Depressive Psychosis in Light of Follow-Up Studies. P. Hoch and H. L. Rachlin, New York.—p. 831.  
Prolonged Coma in Insulin Therapy of the Psychoses. H. Cleckley and C. M. Templeton, Augusta, Ga.—p. 844.  
Internal Environment and Behavior: Part I. Introduction and Role of Oxygen. R. A. McFarland, Cambridge, Mass.—p. 858.  
Id.: Part V. Internal Secretions. C. F. Richter, Baltimore.—p. 878.  
Paradoxic Vestibular Reactions in Schizophrenia Under Influence of Alcohol, of Hyperventilation and Carbon Dioxide Inhalation. A. Angyal and N. Blackman, Worcester, Mass.—p. 894.  
Technic for Modification of Metrazol Therapy Procedure. D. W. Hastings and T. D. Rivers, Philadelphia.—p. 904.  
Dynamic Approach to Study of Replacement Therapy in Cases of Castration. G. E. Daniels and E. S. Tauber, New York.—p. 905.  
Effects of Testosterone Propionate in Impotence. H. T. Carmichael, W. J. Noonan and A. T. Kenyon, Chicago.—p. 919.  
Physiologic and Pharmacologic Investigations on Nature of Hypothalamic Excitation: Preliminary Report. E. Gellhorn, Chicago.—p. 944.  
Analysis of Sex Offenses Among Male Psychiatric Patients. S. H. Ruskin, Eloise, Mich.—p. 955.

### California and Western Medicine, San Francisco

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- Gastrointestinal Diseases: The Newer Therapy. F. H. Kruse, San Francisco.—p. 59.  
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Cutaneous Leishmaniasis, Experimentally Produced. H. J. Templeton, Oakland.—p. 70.  
Management of Chest Injuries. W. B. Faulkner Jr., San Francisco.—p. 71.  
Carbon Dioxide Therapy. M. H. Soley, Karolina B. Jump, San Mateo, and N. W. Shock, Berkeley.—p. 73.  
Roentgen Therapy in Treatment of Absolute Glaucoma. L. Bryan and A. J. Williams, San Francisco.—p. 76.  
The Literary Physician: Note on Osler's Essays. W. White, Los Angeles.—p. 79.

### Cancer Research, Philadelphia

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- Experimental Liver Cancer in Rats and Its Inhibition by Rice Bran Extract, Yeast and Yeast Extract. K. Sugiura and C. P. Rhoads, New York.—p. 3.  
Immunity Induced Against Brown-Pearce Carcinoma. F. S. Cheever and C. A. Janeway, Boston.—p. 23.  
Stimulation of Tumor Induction by Inhibitor of Cell Glycolysis. H. G. Crabtree, London, England.—p. 34.  
Retardation of Rate of Tumor Induction by Hydrolyzing Chlor Compounds. H. G. Crabtree, London, England.—p. 39.  
Preexcisional Fixation of Tissues in Treatment of Cancer in Rats. F. E. Mohs and M. F. Guyer, Madison, Wis.—p. 49.  
Urinary Excretion of Estrogens and Androgens by Women with Carcinoma of Breast. M. Ross and R. I. Dorfman, New Haven, Conn.—p. 52.  
Experimentally Induced Benignancy of Neoplasm: V. Influence of Hormones on Host's Resistance to Implanted Neoplasm. W. T. Salter, I. T. Nathanson and Hildegard Wilson, Boston.—p. 60.

### Connecticut State Medical Journal, Hartford

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Dr. Samuel Holden Parsons Lee: His Life and Times. A. Labensky, New London.—p. 92.  
Rupture of Uterus. M. L. Berlowe, New Haven.—p. 97.  
Treatment of Coronary Artery Disease. H. L. Blumgart, Boston.—p. 102.  
Depressive Reactions in Middle Aged Men. W. B. Terhune, New Canaan.—p. 104.  
State Aid to the Blind in Connecticut. E. M. Blake, New Haven.—p. 110.  
Synovial Sarcoma: Case Report. W. Lechner and A. Schaefer, Hartford.—p. 113.

### Endocrinology, Los Angeles

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- Effects of Anterior Pituitary Preparations in Experimental Pancreatic Diabetes. O. H. Gaebler and H. W. Galbraith, Detroit.—p. 171.  
Behavior and Endocrine Regulators of Internal Environment. C. P. Richter, Baltimore.—p. 193.  
Comparative Androgenic Potency of Testosterone, Methyl Testosterone and Testosterone Propionate Administered in Pellet Form. G. R. Biskind and M. A. Meyer, San Francisco.—p. 217.  
Phenomenon of Antagonism by Pituitary Extract in Absence of Thyroid Gland. G. K. Smelser and L. Levin, New York.—p. 233.  
Some Comparative Effects of Testosterone Derivatives in Monkey. S. A. Vest, J. E. Drew and O. R. Langworthy, Baltimore.—p. 257.  
Experimental Studies on Activity and Toxicity of Stilbestrol. E. Von Haam, M. A. Haumel, T. E. Rardin and R. H. Schoene, Columbus, Ohio.—p. 263.  
Increased Resistance to Syphilis in Rabbit Following Prolonged Administration of Urinary Estrogens: I. Feminizing Effects of Estrogens on Adult Male Rabbits. C. N. Frazier and C. K. Hu, Peiping, China.—p. 283.  
Id.: II. Character of Reaction to Treponema Pallidum in Feminized Male Rabbits. C. N. Frazier and C. K. Hu, Peiping, China.—p. 294.  
\*Studies of Progesterone-like Action of Desoxycorticosterone Acetate in Women. E. C. Hamblen, W. K. Cuyler, C. J. Pattee and G. J. Axelson, Durham, N. C.—p. 306.  
Regulation of Corpus Luteum Function by Hypophysial Luteotrophin. E. B. Astwood, Baltimore.—p. 309.

**Progesterone-like Action of Desoxycorticosterone Acetate in Women.**—Hamblen and his co-workers studied the possible progestational action of desoxycorticosterone acetate in two groups of women; one group of 5 women (average age 25 years) was characterized by the common symptom of secondary amenorrhea from three to nine months and the other group consisted of 3 women (average age 29 years) who received desoxycorticosterone preoperatively. A total of 196 individual determinations was made on alterations in urinary titers of 17-ketosteroids. The average daily values for different patients prior to therapy ranged from 7 to 225 international units and during therapy from 10 to 219 international units. The average daily value for the entire group was 63 international units prior to therapy and 57 international units during therapy. In a total of 156 individual determinations on sodium pregnandiol glucuronide none of the patients excreted pregnandiol complex prior to therapy. During therapy a total of 18 mg. of sodium pregnandiol glucuronide was recovered during three of the eight cycles investigated, an average recovery of 2.25 mg. per cycle. All 5 patients studied had estrogenic endometriums prior to therapy (three hypoestrogenic and two persistent estrogenic). All 5 patients had estrogenic endometriums at the conclusion of the various cycles of therapy. Bleeding followed therapy in four of the eight cycles studied. Untoward clinical responses

were minimal. Two patients experienced definite disturbances in water balance, which involved decreased urinary volume, generalized edema, sensation of thirst, slight acceleration of pulse and slight elevation in blood pressure.

### Journal of Investigative Dermatology, Baltimore

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- Photometric Determination of Bismuth in Urine. N. Benotti and F. M. Thurmon, Boston.—p. 1.  
Dermovascular Action of Estrogen, the Ovarian Follicular Hormone. S. R. M. Reynolds, Brooklyn.—p. 7.  
Dysfunction of Sebaceous Glands Associated with Pellagra. Susan Gower Smith, D. T. Smith and J. L. Callaway, Durham, N. C.—p. 23.  
Ringworm of Scalp: Prolonged Observation, Family Investigation, Cultural and Immunologic Studies in 130 Cases. C. S. Livingood and D. M. Pillsbury, Philadelphia.—p. 43.  
Further Observations on Use of Lipocain in Treatment of Psoriasis. E. N. Walsh, Whiting, Ind.; D. E. Clark, L. R. Dragstedt and S. W. Becker, Chicago.—p. 59.  
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Postarsphenamine Dermatitis: Relation of Vitamin C to Production of Arsphenamine Sensitiveness and Its Use as Adjunct to Further Arsphenamine Therapy in Patients with Cutaneous Hypersensitiveness to Arsphenamines. F. E. Cornia, Montreal, Canada.—p. 81.

### Journal of Nutrition, Philadelphia

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- Iron Balances on Four Normal Preschool Children. Thelma Porter, East Lansing, Mich.—p. 101.  
Effect of Dry Heat on Anticataractogenic Quality of Certain Proteins. Mary D. Henderson and Helen S. Mitchell, Amherst, Mass.—p. 115.  
Effect of A. T. 10 (Dihydrochysterol) on Rickets in Rats Produced by High Calcium-Low Phosphorus Diets. A. T. Shohl and S. Farber, Boston.—p. 147.  
Calcium Content of Normal Growing Body at a Given Age. K. E. Briwa and H. C. Sherman, New York.—p. 155.  
\*Riboflavin Contents of Some Typical Fruits. Caroline Sherman Lanford, Beatrice Finkelstein and H. C. Sherman, New York.—p. 175.  
Distribution of Pantothenic Acid in Certain Products of Natural Origin. T. H. Jukes, Davis, Calif.—p. 193.

**Riboflavin Content of Fruits.**—Lanford and her associates determined the riboflavin content of apples, bananas, grapefruit, oranges, pears and tomatoes and found that the mean content per hundred grams of the edible portions of the respective fruits was 4.3, 47.7, 20, 27.8, 19.8 and 37.3 mg. For canned grapefruit juice it was 11.8 mg. The citrus fruits (orange and grapefruit), banana and tomato appear richer in riboflavin than apples and pears. Considered with reference to the amounts presumably involved in average human nutrition, each hundred calory portion of citrus fruit or of banana contributes its full quota of riboflavin to the dietary, while each hundred calory portion of tomato contributes more, and that of pome fruit (apple or pear) contributes less.

### Journal of Urology, Baltimore

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- \*Pyelonephritis of Pregnancy. G. C. Prather, Boston.—p. 147.  
Calcified Perirenal Pseudohydronephrosis: Hydronephrosis with Communicating Perirenal Cyst with Calcification. C. M. Johnson and D. R. Smith, San Francisco.—p. 152.  
\*Healed Tuberculosis of Kidney. A. H. Baggenstoss and L. F. Greene, Rochester, Minn.—p. 165.  
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Method for Experimental Production of Chronic Bacterial Cystitis in Dogs. W. C. Hueper, C. Virginia Fisher, J. de Carvajal-Forero and M. R. Thompson, New York.—p. 186.  
Total Perineal Prostatectomy: Modification of Previously Published Technique. O. S. Lowsky and R. N. Kilgore, New York.—p. 196.  
Epithelioma of Penis. F. D. Nacgeli, Minneapolis.—p. 202.  
Surgical Treatment of Elephantiasis of Scrotum and Penis. E. de Savitsch, Washington, D. C.—p. 216.  
Relationship Between Pressure in Lower Urinary Tract and Kidney Function. A. J. Miller and A. K. Lampton, Louisville, Ky.—p. 223.  
Treatment of Urethral Strictures and Contractures of Vesical Neck by Means of Diathermy Administered Through a Sound: Preliminary Report. J. A. Lazarus, New York.—p. 229.  
Permanent External Urethrotomy. J. Frumkin, Schenectady, N. Y.—p. 234.  
Experimental Observations on Bacteriostatic Action of Sulfanilamide and Related Compounds on Enterococci, with Particular Reference to Strains Isolated from Urinary Tract Infections. E. Neter, Buffalo.—p. 240.

**Pyelonephritis of Pregnancy.**—Prather discusses three phases of pyelonephritis of pregnancy: 1. Prior to the last few years, sterilization of the upper part of the urinary tract of such a patient was a rare occurrence. Urinary antiseptics

usually failed to produce the desired results, as with these medicaments or with simply a generous fluid intake and rest fever would subside and symptoms would improve, but the urine practically never became sterile. Likewise cystoscopic treatment was similarly effective. The ketogenic diet was not tolerated and mandelic acid, with its restriction of fluid, was not desirable for the acutely ill patient with pyelonephritis. The use of sulfanilamide for infections of the urinary tract during pregnancy was begun with some hesitancy. Its use in pregnant patients, as in the nonpregnant, gave three types of results: 1. Those whose urine becomes sterile during medication and continued sterile during the remainder of the pregnancy even though medication was discontinued; that is, cured. 2. Those whose urine becomes sterile while taking the drug but in whom an afebrile pyuria or bacilluria recurs some time during the remainder of the pregnancy. 3. Those whose urinary sediments are not favorably influenced by sulfanilamide. Of 50 patients with pyelonephritis during pregnancy, 33 were cured with sulfanilamide, the urine of 9 became sterile during medication but an afebrile pyuria recurred during the remainder of pregnancy, and the urinary sediment of 8 did not improve during medication. Forty-seven of the 50 patients went to term, 2 were delivered prematurely and the pregnancy of 1 was interrupted because of uterine fibroids. The babies of the treated patients appeared to suffer no adverse effects, 47 were alive and healthy at birth, 1 was lost when the pregnancy was interrupted, 1 was born with a meningocele, and the data on 1 were not available. Of 50 patients with postpartum infections of the urinary tract who had sulfanilamide medication, in only 1 of 20 instances in which constant drainage was used did the urinary sediment become sterile, and 24 of the 30 remaining patients in whom constant drainage was not necessary were cured. If the two groups are tabulated as a whole there were 50 per cent cures, indicating that sulfanilamide is most effective. The author investigated the problem of recurrent pyelonephritis associated with pregnancy by studying the records of 72 patients who had had pyelonephritis of pregnancy and who later returned to the hospital with one or more pregnancies. In approximately 65 per cent the subsequent pregnancy was normal. Seventeen of the 72 patients had a recurrent pyelonephritis in their subsequent pregnancy. Of 43 patients who were known to have sterile urine between pregnancies, 8 had pyelonephritis in their subsequent pregnancy. This is about nine times the normal incidence of pyelonephritis in pregnancy. Of 36 patients whose urines were still infected or unreported during the interval between pregnancies, 14 had pyelonephritis in the subsequent pregnancy. This is about twenty times the normal incidence of pyelonephritis in pregnancy. Of the 72 patients with pyelonephritis of pregnancy who returned later in another pregnancy, the succeeding pregnancies of only 9 were complicated by toxemia. Therefore the author does not think that pyelonephritis should be considered as a cause of toxemia. However, until a larger series is available it can be said that only these data indicate that pyelonephritis is not a cause of toxemia of pregnancy.

**Healed Tuberculosis of Kidney.**—Baggenstoss and Greene cite the 15 cases (13 men and 2 women) of healed or regressing tubercles of the kidney encountered at the Mayo Clinic during eighteen years. Nine of these healed military tubercles were found incidentally at necropsy and the remaining 6 instances were similar military tubercles with definite evidence of regression but slight microscopic evidence of activity. In none of the cases was there any clinical evidence of either renal or pulmonary tuberculosis. The authors believe that these 15 cases probably represent only a small proportion of the cases in which tubercle bacilli actually lodged in the kidney. It is likely that in a significant number of cases these small tubercles are overlooked at necropsy, especially when they are located beneath the surface of the renal cortex. It is also likely that the lesions may often not be typical and are not recorded as tuberculosis. Also tuberculous lesions may heal without leaving a trace. Although the evidence presented demonstrates that tuberculosis of the kidney does heal, the authors agree with those who believe that when renal tuberculosis reaches the stage at which it gives rise to symptoms and clinically demonstrable changes it rarely if ever heals.



Probably the two most important factors in the healing of the tuberculous renal lesions were the comparative fewness of the infecting organisms and high individual resistance. That bacilli in the blood were few is suggested by the small size of the lesions and by the fact that the lesions were single in all but 1 case, were found in only one kidney and in some instances the kidney, other than the lungs, was the only site of the involvement. That active resistance to the infection was present is indicated by the fact that in each of these cases healing also occurred of the tuberculous lesions in the lung, hilar lymph nodes, liver or spleen.

### Medical Annals of District of Columbia, Washington 10:39-78 (Feb.) 1941

\*Studies on Oxyuriasis: IX. Familial Nature of Pinworm Infestation. Eloise B. Cram, Washington.—p. 39.

Clinical and Electrocardiographic Findings in the Aging Heart. H. B. Sprague, Boston.—p. 49.

Prevention and Treatment of Infected Wounds. W. W. Sager, Washington.—p. 56.

\*Treatment of Pyogenically Infected Wounds by Topical Application of Powdered Sulfanilamide and Sulfanilamide-Allantoin Ointment: Preliminary Report. J. R. Veal and R. G. Klepser, Washington.—p. 61.

**Familial Nature of Pinworm Infection.**—Cram discusses the incidence of familial pinworm infection determined during four years by examining the members of a person's family who came to the parasite clinic. A total of 320 families (1,525 individuals) were studied. In 286 white families the incidence of pinworms found among the 860 children examined was twice as much as that among the 493 adults; respectively 72 and 36 per cent were positive as a result of 4,940 swab examinations. The respective percentages for the 114 children and 58 adults in 34 Negro families were 51 and 7. Among the 286 white families 4 had no children and of the 11 adults examined 5 were positive. In the white families multiple cases were the rule rather than the exception; in only 70 of the 286 families was the infection confined to a single case; in the remaining 216 families an average of 3.4 persons per family was positive. In slightly more than one half of the Negro families only a single case was found. Generally the incidence was lower in the Negro families than in the white families; the difference was especially marked in adults. This difference in familial extent in the two races conforms to differences in incidence found in the entire survey, which involved the examination of 4,000 persons of the general population of Washington, D. C. In 125 of the white families, all children who were examined were found positive. In the remaining families evidence of infection was found in more than one half of the children examined. All the adults in 49 families were infected. Therefore the quantitative evidence is that oxyuriasis is frequently a familial infection. This is of great importance in connection with therapy and prophylaxis. The frequency with which positive swabs were secured from infected individuals was 54 per cent of the swabs of white children and 53 per cent of Negro children, as compared with 47 and 43 per cent of infected white and Negro adults, respectively. These observations emphasize the necessity of multiple swab examinations in the diagnosis of oxyuriasis.

**Powdered Sulfanilamide and Sulfanilamide-Allantoin Ointment for Pyogenic Wounds.**—Veal and Klepser report the results of the topical application of powdered sulfanilamide to 140 pyogenic infections. The infections included operative wounds, burns, compound fractures, leg ulcers, decubitus ulcers and traumatic wounds. In practically all the infections there was a mixture of organisms; the most common invaders were streptococci, staphylococci, the colon group and diphtheroids. In some the growth of *Bacillus pyocyaneus* was extensive. Regardless of the various bacteria found sulfanilamide caused an immediate inhibition of growth as judged by smears, plated colony counts and gross appearance of the exudate. A single application of the drug was not sufficient to prevent revival of growth. Repeated daily doses caused a rapid decline in bacterial activity, and plated cultures showed a progressive diminution until about the eighth day, when they became practically sterile. As sulfanilamide seemed to retard healing it was decided to incorporate it into an ointment. Several attempts were made with inert bases. Finally an effective combination with allantoin was found (10 per cent sulfanil-

amide, 2 per cent allantoin, 0.5 per cent chlorobutanol and enough greaseless base for the desired consistency. The base used was a glycerinated stearic acid ointment with triethanolamine. In a number of cases the same ointment was used without including allantoin in the formula. Although the wounds healed and lacked the indolent phase characteristic of full strength sulfanilamide, the growth of granulation tissue was not as rapid or as freely bleeding as when the allantoin was used. The routine technic for the treatment of all pyogenic wounds now is careful and complete débridement of the wound, drainage of all pus pockets, removal of all necrotic and devitalized tissue and the application of a sufficient amount of pure sulfanilamide powder to cover the diseased tissue completely. A sterile gauze dressing is applied over the powder, and fresh sulfanilamide powder is applied daily until (from four to six days) the purulent exudate ceases and the infection is under control. The sulfanilamide-allantoin ointment is then substituted for the powdered sulfanilamide. It is applied daily and covered with a gauze or oiled silk dressing. The granulation tissue responds quickly; it loses its pale and anemic color within a few days and is red and healthy. The infection remains under control, and normal healing is reestablished. The method has proved highly effective in combating the pyogenic organisms which are commonly encountered. The action of the drug seems to be entirely local. Its effectiveness is apparently in proportion to its concentration. No constitutional toxic reactions were observed.

### Medicine, Baltimore

20:1-144 (Feb.) 1941

Intracranial Aneurysms: Clinical and Pathologic Study of Subarachnoid and Intracerebral Hemorrhage Caused by Berry Aneurysms. J. C. Richardson and H. H. Hyland, Toronto, Canada.—p. 1.

Periodic Paralysis: Clinical Syndrome. J. H. Talbott, Boston.—p. 85.

### New Jersey Medical Society Journal, Trenton

38:63-108 (Feb.) 1941

Prevention and Treatment of Postoperative Pulmonary Complications. G. N. J. Sommer Jr., Trenton.—p. 67.

Treatment of Chronic Nephritis in Light of Contemporary Physiology. S. R. Miller, Baltimore.—p. 74.

Gastrointestinal Disturbances in Endocrinologic Disorders. Rita S. Finkler, Newark.—p. 81.

Differential Diagnosis of Fundus Lesions Associated with Hypertensive Vascular Diseases. M. Cohen, New York.—p. 84.

Signs and Symptoms of Aging and Its Treatment. C. P. Segard, Leonia.—p. 87.

### Oklahoma State Medical Assn. Jour., Oklahoma City

34:47-104 (Feb.) 1941

Perforated Peptic Ulcer. C. M. O'Leary and C. E. Clymer, Oklahoma City.—p. 47.

Management of Tuberculous Patients. F. Moorman, Oklahoma City.—p. 51.

Admission of Tuberculous Patients and Their Care After Dismissal. R. M. Burke, Clinton.—p. 53.

Allergy to Liver Extract. W. T. Bynum, Chickasha.—p. 55.

Tuberculin Testing in Murray County, Oklahoma. R. M. Burke, Sulphur.—p. 57.

### Pennsylvania Medical Journal, Harrisburg

44:545-672 (Feb.) 1941

Study of Consecutive Cases of Hypertension and Albuminuria in Pregnancy. F. C. Irving, Boston.—p. 557.

Pneumonia Deaths and Deaths from Pneumonia: Critical Analysis of 131 Deaths Ascribed to Pneumonia. C. P. Faller, K. E. Quicquel and C. W. Smith, Harrisburg.—p. 563.

\*Pneumonia in Children: Review of 1,000 Consecutive Cases of Lobar and Bronchopneumonia in Children Treated Without Specific Therapy. J. W. Holmes, J. A. Jones and N. H. Einhorn, Philadelphia.—p. 571.

Acute Otitis Media and Mastoiditis in Children. H. J. Williams, Philadelphia.—p. 590.

Pain in the Right Lower Abdomen in Women. C. Lintgen, Philadelphia.—p. 593.

Advantages of Intranasal Tear Sac Operation. J. M. West, Allentown.—p. 599.

Some of the Important Problems of Adolescence: Role of the Pediatrician in Their Management. S. Goldberg and N. H. Einhorn, Philadelphia.—p. 603.

Subcutaneous Urography. J. H. Vastine 2d and D. A. Sampson, Philadelphia.—p. 606.

Shortcomings of Intravenous Urography. D. M. Davis, Philadelphia.—p. 612.

**Pneumonia in Children.**—Holmes and his colleagues studied the duration, mortality and incidence of complications of 1,000 consecutive cases of lobar pneumonia and bronchopneumonia in children less than 12 years of age who received



no specific therapy (serum or sulfapyridine). The series can be used as a control in comparing results of specific therapy. The records studied are of patients admitted to six pediatric services of the Philadelphia General Hospital from March 1, 1933 to Dec. 31, 1938. The extent of the study over several years precludes the factor of the yearly variation in the virulence of the causative organism. Of the 537 patients with lobar pneumonia, 82 were less than 2 years of age and 455 between 2 and 12 years. Conversely, 319 of those with bronchopneumonia were less than 2, and 144 were from 2 to 12 years of age. Lobar pneumonia was encountered more frequently in male than in female children; 320 males and 217 females and 249 boys and 214 girls in the bronchopneumonia series. There were 318 white and 219 Negro children in the lobar pneumonia group and respectively 235 and 228 in the bronchopneumonia group. The lowest incidence was observed during August and the highest during March and April. Almost as high an incidence prevailed during January, February and May. In 50 per cent of both lobar pneumonia and bronchopneumonia cases there was a definite history of an antecedent infection of the upper part of the respiratory tract. Fever was the most frequent symptom in both types, occurring in 94 per cent of the lobar and 90 per cent of the bronchopneumonia cases. A higher fever was encountered on admission in lobar pneumonia. Next to fever in frequency was cough. Chills, rapid breathing, chest and abdominal pain, gastrointestinal symptoms, vomiting and anorexia were other frequent symptoms. Acute suppurative otitis media prior to admission was infrequent in both groups, although it was four times as common in bronchopneumonia as in lobar pneumonia. During hospitalization, cyanosis, abdominal distention, meningism and convulsions were observed. The day of onset was ascertained with any degree of accuracy in only 504 of the 537 cases of lobar pneumonia. The average duration of its acute phase computed from the time of onset to the time a normal temperature was maintained was five and one-tenth days. In the bronchopneumonia group the average duration in 421 cases was twelve and a half days. There were 124 errors among the 1,000 primary diagnoses; pharyngitis, acute bronchitis, influenza and acute tonsillitis accounted for 74, meningitis for 15 and gastrointestinal disorders for 13 and appendicitis, tuberculosis, pyelitis, empyema and tetany for some of the other errors. Acute suppurative otitis media was the most frequently encountered complication. It developed in a total of 278, or 27.8 per cent, of the cases; its incidence in bronchopneumonia was 38 per cent and in lobar pneumonia 18 per cent. Empyema occurred in 34 of the 1,000 cases. Two of these patients died before empyema was discovered. There were no mortalities among the remaining 32 cases. There were only 22 other complications: abscesses, meningitis, purpura. There were a total of 88 deaths among the 1,000 patients; only 7 of these occurred among the lobar pneumonia patients. Seventy of the 81 deaths in the bronchopneumonia group were of children less than 2 years of age; 28 of these 70 deaths occurred during the first six months of life. This demonstrates the high mortality from bronchopneumonia during infancy. Essentially, treatment of the 1,000 patients consisted in good nursing care with minimal disturbance to the patient, maintenance of fluid intake, prevention of cross infection and blood transfusions and oxygen when indicated. Drugs, enemas, tepid sponge baths and the like were not used as a routine but rather for the relief of special symptoms: severe cough, restlessness, delirium, abdominal distention and continued high fever. It is hoped that sulfapyridine or allied chemicals will be valuable in reducing the high mortality from bronchopneumonia.

### Psychoanalytic Quarterly, Albany, N. Y.

10:1-182 (Jan.) 1941

- Psychodynamic Study of Recovery of Two Schizophrenic Cases. T. M. French, Chicago, and J. Kasanin, San Francisco.—p. 1.  
The Repetitive Core of Neurosis. L. S. Kubie, New York.—p. 23.  
Co-Conscious Mentation. C. P. Oberndorf, New York.—p. 44.  
Predisposition to Anxiety. Phyllis Greenacre, New York.—p. 66.  
Stuttering: Case. Else Heilpern, Topeka, Kan.—p. 95.  
Psychic Trauma and Productive Experience in the Artist. H. Lowenfeld, New York.—p. 116.

### Public Health Reports, Washington, D. C.

56:211-258 (Feb. 7) 1941

- Qualifications of Professional Public Health Personnel: III. Nurses. M. Derryberry and G. Caswell.—p. 211.  
Note on the "Most Probable Number" Index as Used in Bacteriology. J. M. DallaValle.—p. 229.

56:259-310 (Feb. 14) 1941

- Response of Peritoneal Tissue to Industrial Dusts. J. W. Miller and R. R. Sayers.—p. 264.  
Immunologic Relationships Between Rickettsiae of Australian and American Q Fever. Ida A. Bengtson.—p. 272.  
Inhibiting Effect of Urea on Microbiologic Assay of Riboflavin. H. Isbell, J. G. Wooley and H. F. Fraser.—p. 282.  
Studies on Natural History of Virus of Lymphocytic Choriomeningitis in Mice. V. H. Haas.—p. 285.  
Note on Modified Radio Pratique in Guayaquil. R. Olesen.—p. 292.

### South Carolina Medical Assn. Journal, Greenville

37:25-44 (Feb.) 1941

- Cocaine Poisoning Treated with Morphine: Case Report. N. O. Eaddy, Sumter.—p. 25.  
Uterine and Ovarian Tumors Complicating Pregnancy. R. E. Seibels, Columbia.—p. 26.  
Follicular Nasopharyngitis: Frequent Cause of Fever of Undetermined Origin. J. W. Jervy Jr., Greenville.—p. 30.  
Ubiquitous Influenza. L. Banov, Charleston.—p. 31.

### Southern Medical Journal, Birmingham, Ala.

34:135-238 (Feb.) 1941. Partial Index

- Muscle Pathology in Anterior Poliomyelitis: Its Relation to Function. H. E. Hipps, Marlin, Texas.—p. 135.  
Congenital Syphilis in Only One of Twins. F. R. Smith Jr. and J. M. Spence Jr., Baltimore.—p. 147.  
Observations on Effectiveness of a Yeast-Peanut Butter Mixture in Vitamin B Complex Deficiencies: Progress Report. T. D. Spies, Cincinnati, H. M. Grant and J. M. Grant, Birmingham, Ala.—p. 159.  
Hypoproteinemia and Vitamin K in Nutritional Deficiency States. E. D. Warner, Iowa City; T. D. Spies, Cincinnati, and C. A. Owen, Iowa City.—p. 161.  
"Pot Liquor": Neglected Source of Vitamin C for Feeding of Infants. Margaret L. Keller and A. S. Minot, Nashville, Tenn.—p. 163.  
\*Ariboflavinosis, with Special Reference to Ocular Manifestations. V. P. Sydenstricker, A. R. Kelly and J. W. Weaver, Augusta, Ga.—p. 165.  
Studies in Radiation Sickness: II. Vitamins B<sub>1</sub> and C and Small Intestinal Change in Radiation Sickness. W. S. Wallace, Galveston, Texas.—p. 170.  
Test for Pregnancy: Technic and Comparative Results. R. Paddock, St. Louis.—p. 174.  
Incidence of Intestinal Parasites in Fecal Samples Collected in Eastern Oklahoma. D. B. McMullen, Oklahoma City, and J. K. Gray, Tahlequah, Okla.—p. 177.  
Allergic Conjunctivitis. R. Bowen, Houston, Texas.—p. 184.  
Pruritus Ani et Vulvae: Symptom of Eczema: Further Observations and Report of Sixty-One Additional Cases. H. Hailey, Atlanta, Ga.—p. 191.  
Etiology and Treatment of Pulmonary Hemorrhage, with Especial Reference to Bleeding in Cases of So-Called "Dry Bronchiectasis." P. P. Vinson, Richmond, Va.—p. 203.  
Pharyngeal and Laryngopharyngeal Cancer: New Combination of Surgery and Radiation Therapy in Their Treatment: Preliminary Report of Four Cases. M. F. Arbuckle and A. C. Stutsman, St. Louis.—p. 219.

**Ariboflavinosis and Ocular Changes.**—Sydenstricker and his colleagues state that their 120 patients with ariboflavinosis experienced rapid symptomatic improvement following riboflavin therapy. They observed that photophobia may be relieved after seventy-two hours of treatment; dim distant vision and twilight blindness may be cured in the same time. Mydriasis and defects in accommodation disappear concurrently. Dysphagia, gastric discomfort and general malaise have seldom persisted after the third day of treatment. Glossitis is the first anatomic lesion to show changes; usually the tongue is restored to normal color and texture by the third day. Corneal vessels respond almost as rapidly. By the fourth day of treatment there is obvious emptying of the smaller capillary channels and interruption of the flow of blood in the larger ones. In early cases all invading capillaries may be empty by this time. In patients with severe keratitis maximal improvement occurs during the second week of treatment; by then all capillaries are empty. Large vessels are not obliterated after as long as a year, though they diminish in size. The shortest time for the complete disappearance of subepithelial capillaries has been ten months. The amount of riboflavin required for satisfactory improvement depends on the adequacy of the diet and the ability of the patient to extract and utilize riboflavin from natural sources. Under experimental conditions with a diet poor in all vitamins 5 mg. of

riboflavin daily by mouth has given rapid cure. In the presence of gastric achlorhydria, diarrhea or severe hepatic disease from 10 to 15 mg. daily may be required. In cases of severe polyavitaminosis with vomiting and diarrhea, from 10 to 15 mg. of sodium riboflavin given intravenously may be required. Under uncontrolled conditions with a nearly adequate diet, 3 mg. daily is adequate for the cure and maintenance of most patients.

## Surgery, Gynecology and Obstetrics, Chicago

72:129-256 (Feb. 1) 1941

- Human Corpus Luteum of Pregnancy. J. Gillman and H. B. Stein, Johannesburg, South Africa.—p. 129.
- Carcinoma of Thyroid Gland. J. C. McClintock, G. H. Kline Jr., Albany, N. Y., and J. E. Conrad, Little Falls, N. Y.—p. 150.
- Transplantation of Skin and Subcutaneous Tissue to the Hand. S. L. Koch, Chicago.—p. 157.
- \*The Problem of Hypoproteinemia in Surgical Patients. D. Casten and M. Bodenheimer, New York.—p. 178.
- Experimental Study of Ureterointestinal Implantation: IV. Significance of Uterovesical Reimplantation in the Dog. H. M. Weyrauch, R. A. Burns, R. A. Peterfy and F. Hinman, San Francisco.—p. 192.
- Genesis of Peptic Ulcer in Dogs Following Ligation of Common Bile Ducts. J. L. Carr and F. S. Foote, San Francisco.—p. 198.
- \*Clinical Value of Serum Amylase Test. E. F. Lewison, Baltimore.—p. 202.
- Cancer of Rectum and Rectosigmoid: Its Surgical Treatment. F. W. Rankin, Lexington, Ky.—p. 213.
- \*Pectin in Treatment of Various Types of Wounds. C. A. Tompkins, Grace W. Crook, Edith Haynes and M. Winters, Indianapolis.—p. 222.
- Principles Underlying Treatment of Scoliosis by the Wedging Jacket. R. T. McElvenny, Oak Park, Ill.—p. 228.
- Treatment of Fistula and Obstruction of Small Intestine by Complete Exclusion. E. L. Keyes and I. C. Middleman, St. Louis.—p. 237.
- Surgical Treatment of Chronic Lymphedema (Elephantiasis). G. H. Pratt and I. S. Wright, New York.—p. 244.

**Hypoproteinemia in Surgical Patients.**—Casten and Bodenheimer point out that from clinical and experimental evidence one must conclude that there is undoubtedly a specific mechanism or organ which controls the formation of serum proteins. This is of great importance in therapy, for if this mechanism or organ is impaired it is obviously futile to administer proteins which cannot be utilized to regenerate serum proteins. There is some evidence which indicates that the liver is the regenerating site. Edema is a result of hypoproteinemia and it is attributable to alterations in the mechanics of fluid distribution between the vascular and the extravascular spaces which are caused by a decrease in the colloidal osmotic pressure of the blood induced by a deficiency of the serum albumin. Many other factors may also influence this edema. Among them are tissue elasticity, water balance and the character and distribution of the electrolytes of the body fluids. Almost all the clinical manifestations of hypoproteinemia (peripheral edema, pulmonary edema and disturbances in gastrointestinal motility and wound healing) can be explained on the basis of disturbances in fluid distribution. Treatment is not always satisfactory, as the exact mechanism responsible for serum protein production is not known. Since the liver plays a definite and important role, treatment should be directed toward protecting and sustaining this organ. A high protein and carbohydrate intake is essential. Substitution therapy, whole blood or plasma transfusions, parenteral administration of amino acids or orocejunal feeding of amino acids has had some success. In the authors' experience massive transfusions of plasma have provoked the greatest and most sustained rise in the serum proteins. The treatment of hypoproteinemia should be prophylactic. All patients about to undergo serious operative procedures should be carefully studied for disturbances in serum proteins, vitamins and fluids. If depletion of serum proteins is present the operation should, if possible, be postponed until the concentration is normal; frequently a high protein diet will suffice. If the necessary food elements are not absorbed when administered by mouth, other methods must be instituted. It is fortunate that many, if not most, surgical patients in whom hypoproteinemia develops exhibit no serious defect in the regeneration of serum proteins. The deficiency is usually amenable to treatment, and consequently the impairment in the mechanism of protein regeneration is slight. Malnutrition may affect the liver and impair its ability to synthesize serum proteins. Probably the restoration of the nutritional state to normal remedies this disability; frequently the proper administration of protein does replenish the serum

proteins and overcomes hypoproteinemia and its concomitant manifestations. In cases resistant to protein therapy, attention must be given to the liver. There is ample evidence that a high protein and carbohydrate intake is essential to protect the liver from damage by anesthetic agents or other noxious substances. This should guide the preoperative and postoperative care of patients and it may prevent hypoproteinemia from developing. Large amounts of intravenous dextrose in a 10 per cent solution in distilled water and a high protein diet by mouth or through an indwelling tube is the best means of preparing the liver for the shock of surgery or treating it when it has been damaged.

**Clinical Value of Serum Amylase Test.**—Lewison discusses 1,500 serum amylase studies in 900 representative patients in an effort to correlate the facts established by experimental investigation with the clinical factors observed in health and disease; to point out, if possible, the pathologic conditions in which the serum amylase test is of value, to determine its limits of utility and to caution against its sources of error. The method employed in the investigation (McClure, Wetmore and Reynolds, 1921) is based on the determination of the reducing sugar formed in the enzymatic hydrolysis of starch by a modification of the Folin Wu technic. In the preparation of the reagents and the analytic procedure the standards employed by Somogyi (1938) were observed. Although the analytic procedure employed is open to much the same criticism applied to all sugar reduction methods, practical experience under carefully controlled conditions with 1,500 serum amylase determinations has minimized the sources of error and the author believes the reliable nature of the results themselves is justified. Their interpretation and application to clinical conditions remain a matter of continued correlated study and medical judgment. Some of the diseases studied were appendicitis, cardiovascular, diabetic, gynecologic, genitourinary, neoplastic, rectal, infectious, gastrointestinal and thyroid. The author's conclusions are that: 1. Age, sex, diet, vitamin deficiency and starvation have practically no effect on serum amylase values. 2. Normal serum amylase levels ranged within constant limits when determined by a reliable method. 3. Because of the indiscriminate chemical composition and enzyme concentration in urine, feces and duodenal contents, amylase activity under such conditions is less uniform and diagnostically less trustworthy. 4. Ninety-four per cent of 720 patients having clinical conditions other than mumps or diseases of the biliary system had normal serum amylase values. 5. Patients with mumps had elevated amylase levels. 6. Patients with hepatic disease, regardless of kind, often had depressed amylase activity. 7. Deviation from normal occurred infrequently in diseases other than pancreatitis. The range of the deviation was rather restricted and not a source of diagnostic confusion. 8. A prompt and significant rise in serum amylase activity occurred in 4 cases of acute pancreatitis in which the diagnosis was confirmed and in 6 similar cases in which the diagnosis was presumptive. The amylase elevation reached its peak within the first forty-eight hours of the disease and usually returned to normal several days thereafter. 9. The determination in this disease is a most helpful and reliable diagnostic aid, particularly if the pancreatitis is to be treated conservatively.

**Pectin for Wound Treatment.**—Tompkins and his associates state that experimental work undertaken to explain the excellent results obtained with the apple diet and a pectin agar preparation (nickel pectin) in diarrhea of infants demonstrated that the pectin being used had bactericidal action under certain conditions. The possible therapeutic action of pectin solutions in the treatment of infected wounds was speculated on, and clinical evidence has accumulated to show that other pectins as well as the nickel pectin mixture have definite value in the treatment of wounds. Pectin powder is used in aqueous solutions in percentages which vary according to the case to be treated. Solutions ranging from 2 per cent (on the basis of 100 grade pectin) to as high as a thick paste of 10 per cent have been used. Solutions of pectin may become contaminated with fungi and, to prevent this, aqueous merthiolate was added to make a dilution of 1:200,000. This not only prevented growth of fungi but enhanced the bactericidal effect of the solutions and yet was dilute enough so that it was not toxic to tissue. Sterile

gauze dressings are saturated with the pectin solution, or the solution is applied directly to the lesions as needed. The dressings are changed as often as necessary to keep them moist. By using petrolatum gauze, oiled silk, heavy waxed paper or parafilm over the pectin dressings with a dry dressing over that, evaporation (which is excessive) is reduced to a minimum. During three years the authors treated 75 patients by this method. The series included 25 decubitus and trophic ulcers, 23 chronic discharging wounds, 19 operative wounds with drainage or secondary infection, 5 superficial wound infections and 3 traumatic wounds. Fifty-seven of these were treated with the nickel pectin solution and 18 with nickel-free pectin solution. No essential difference was observed in the results obtained in the two groups. The pectin dressings brought about a prompt visible change in the wound. The wound takes on a healthy appearance and fills in from the bottom with rapid formation of granulation tissue. This new tissue is of a smooth bright red type with a healthy glistening sheen, is firm and shows vigorous growth. The bactericidal effect of the pectin, merthiolate and the nickel when present appears to be only a part of the total therapeutic action. A considerable portion of the curative effect may be due to the hygroscopic property of pectin solutions which results in the decrease of edema in the granulations and leads to healthy wound healing. The granulation tissue which forms is actively growing and apparently not edematous and seems to rid itself of the effects of the infecting bacteria. The mechanical removal of organisms, pus and serum, with change of dressings, is probably also of some benefit. The acidity of the material does not seem to cause any irritation to tissue. On the contrary, the pectin dressings to the various types of lesions, according to patients, decreases the discomfort, particularly of infected operative wounds. Objectionable odors are absent. This is especially noteworthy in cases of osteomyelitis. The authors do not believe that the pectin has any direct influence on epithelization; in fact, pectin may inhibit this stage of healing. Accordingly, when a wound is clean and has filled to the desired degree, other medications are used to keep the lesion clean during epithelization. Except for cases of osteomyelitis there are no comparable series to serve as controls. However, the factor of case differences would not permit definite comparisons. Nevertheless the results in most of the 75 cases exceeded the usual expectations, and in many instances wounds that had been treated by the customary measures with no success showed prompt response to the pectin therapy. Results were good or excellent in practically every case. One superficial burn case and 1 case of impetigo failed to respond, as did a tuberculous nephrectomy wound in which sinuses continued to develop. In the cases of osteomyelitis the healing time following sequestrectomies was reduced by about one fourth of that required under other methods of treatment. These results have been confirmed by Thomson, who reports the use of 2 per cent pectin solutions for old infected burns, pressure sores, infected soft tissue wounds, osteomyelitis and infected compound fractures.

### Tennessee State Medical Assn. Journal, Nashville

34:41-82 (Feb.) 1941

Advances in Treatment of Cancer with Radiation. C. L. Martin, Dallas, Texas.—p. 41.

\*Radiation Therapy in Treatment of Infection. F. B. Bogart, Chattanooga.—p. 48.

Prolonged Labor. E. F. Buchner Jr., Chattanooga.—p. 61.

**Radiation Therapy in Treatment of Infection.**—Bogart obtained satisfactory results with irradiation in 83 per cent of 240 cases of inflammatory lesions. The types of lesions treated were adenitis, carbuncle, cellulitis, furunculosis, erysipelas, herpes zoster and simplex, chronic otitis media, sinusitis, infected salivary glands, gas bacillus infection and others. Staphylococcal infections generally give better results than streptococcal infections. For acute inflammatory lesions that are treated early, from 75 to 100 roentgens is given over the area on three successive days. When treatment is delayed until areas of necrosis or frank suppuration have occurred, doses of from 50 to 100 roentgens are used daily for two or three days and then at intervals of two or three days until a total of five treatments have been given. In chronic inflammatory lesions from 100 to 150 roentgens is given weekly or biweekly for from six to twelve weeks. For blastomycosis it may be

best to give from 300 to 400 roentgens and to repeat it at intervals of two or three weeks for three or four doses. Approximately two thirds of the average adult dose is used for children. The kilovolts and filtration are decided by the depth of the lesion. When from 85 to 100 kilovolts is used, from 1 to 2 mm. of aluminum filtration is sufficient. When 140 kilovolts is used, from 4 to 6 mm. of aluminum filtration is used. When the lesion is deep seated, 200 kilovolts is used with a filtration of from 0.5 to 1 mm. of copper and 1 mm. of aluminum. Some filtration should always be used.

### Texas State Journal of Medicine, Fort Worth

36:655-716 (Feb.) 1941

Trauma to Heart. C. S. Beck, Cleveland.—p. 660.

Blood Dyscrasias Treated by Splenectomy. H. Dudgeon Jr., Waco.—p. 664.

Hypopharyngeal Diverticulectomy Combined One Stage Operation. A. B. Small and B. Barr, Dallas.—p. 667.

So-Called Old Age Strokes. P. M. Bassel and B. N. Blanton, Temple.—p. 670.

Cancer of Uterus. H. M. Tigert, Nashville, Tenn.—p. 673.

Intensive Irradiation in Treatment of Hyperthyroidism. R. G. Giles, San Antonio.—p. 675.

Is Operation for Senile Cataract on Ambulatory Patient Justifiable? J. H. Burleson and M. W. McCurdy, San Antonio.—p. 680.

The Educational Needs of the Health Officer. J. W. Bass, Dallas.—p. 684.

Significance of a Dental Public Health Program for the Preschool Age Child. F. C. Elliott, Houston.—p. 688.

Interpretation of Visualized Gallbladder. G. Turner, El Paso.—p. 692.

### Virginia Medical Monthly, Richmond

68:131-188 (March) 1941

Peripheral Vascular Disease in Industry. B. T. Horton, Rochester, Minn.—p. 131.

Maternal Deaths in Virginia. M. P. Rucker, Richmond.—p. 138.

Spontaneous Pneumothorax of the Newly Born: Report of Case. W. H. Wood Jr. and W. H. Paine, Charlottesville.—p. 148.

Laboratory Procedures in Differential Diagnosis of Jaundice. J. H. Scherer, Richmond.—p. 151.

Postpartum Hemorrhage. H. Picot, Alexandria.—p. 154.

Coronary Thrombosis in 21 Year Old Male Following Hyperthermia. T. R. Dawber, Norfolk.—p. 156.

Response of Manic-Depressive Psychosis to Alcohol: Case History. B. F. Phillips, Quantico.—p. 158.

Xerophthalmia and Keratomalacia Associated with Obstructive Biliary Cirrhosis. J. B. Stone and R. H. Courtney, Richmond.—p. 159.

Nonoperation Treatment of Carbuncles. B. A. Rice, Forest.—p. 163.

Ossifying Fibroma: Thenar Space. B. H. Kyle, Lynchburg.—p. 165.

### Western J. Surg., Obst. & Gynecology, Portland, Ore.

49:71-134 (Feb.) 1941

Intubation Management of Distention in Intestinal Obstruction. L. C. Bennett, Los Angeles.—p. 71.

\*Pulmonary Embolism: Review of Literature with Additional Statistics Gathered from Study of 247 Cases. P. R. Westdahl, San Francisco.—p. 77.

Differential Diagnosis of Acute Appendicitis in the Female. H. E. Schmitz and F. D. Yoder, Chicago.—p. 84.

Surgical Treatment of Essential Hypertension. W. Crane, Oakland, Calif.—p. 88.

Management of Labor: Critical Study of 1,538 Consecutive Deliveries. C. H. Davis, Wilmington, Del.—p. 91.

Influence of Suckling Stimulus on Lactation. H. L. Stewart Jr. and J. P. Pratt, Detroit.—p. 98.

Gonorrhea Complicating Pregnancy: Study of 228 Cases. J. B. Bernstein and G. W. Bland, Philadelphia.—p. 104.

Routine Chest Roentgenograms in Pregnancy: Study Based on 800 Consecutive Cases. H. K. Graham, San Diego, Calif.—p. 107.

Further Use of Dihydrochlorysterol (A. T. 10). H. Blum, Lincoln, Neb.—p. 113.

Granulomas in Struma Fibrosa of Thyroid. W. M. German, Cincinnati.—p. 120.

**Pulmonary Embolism.**—Westdahl summarizes the important data of 247 cases of pulmonary embolism, of which 166 were medical, 80 postoperative or post-traumatic and 1 occurred post partum. Of the 138 nonsurgical cases that proved fatal, necropsy in 128 was performed; 56 of the 64 fatal cases with a surgical background were also studied post mortem. The 1 obstetric patient recovered. The diagnosis in all the cases in which recovery occurred was made by the presence of one or more episodes of sudden localized chest pain and an otherwise unexplained blood streaked sputum. The fatal medical cases not verified by necropsy were also diagnosed by these symptoms. The majority of postoperative patients died suddenly or rapidly after shock and signs and symptoms referable to the chest unexplained on any other basis. Two explanations for the high percentage of cases not diagnosed clinically are that the majority

of small emboli produce no recognizable clinical symptoms and predominate in the medical group. Large emboli not recognized occurred in patients whose poor condition overshadowed the signs and symptoms of embolism. Therefore prevention in the latter group is to be stressed. The majority of surgical cases followed abdominal operations. The age among the nonfatal surgical patients is less than that of the total surgical group. Embolism implies thrombosis, and the latter is caused by slowing of the blood flow, increased coagulability of the blood and irregularity in the vessel wall. Slowing of the blood flow is of primary importance. Steps to prevent its occurrence in selected cases can be taken. Its source is most often found in mural thrombi in the auricular appendages where eddy currents are prevalent. Compression is normally present in the left iliac vein as it crosses the promontory of the sacrum and the femoral vein beneath Poupert's ligament. Because of the normal intima, a thrombus is loosely adherent to the vessel wall and can be easily set free by a sudden increase in venous pressure, which secondarily causes dilatation of the veins. This occurs in various forms of straining, and pulmonary embolism often follows such an event. A further factor contributing to stasis is the general immobility of the patient. Regarding the second factor, increased coagulability, after operations and deliveries there is a sharp, constant rise in fibrinogen and a marked increase in platelets. The third factor is an important cause of thrombosis, but not of the type from which massive, fatal emboli arise. The thrombus will be firmly adherent to the intima if the wall of the vessel is damaged, and large emboli are unlikely to break loose. In addition to the three classic factors, obesity and infection are of etiologic importance. The authors point out that more than 70 per cent of medical cases occurred in cardiac conditions in which preventive measures are impracticable. Therefore prevention is confined to post-operative patients. Active and passive motion of the lower extremities is the most effective means of increasing the blood flow and should be encouraged and even enforced in cases in which emboli are prone to occur. The poorer the patient's condition the greater is the need for periodic passive exercise and massage. Exercise is contraindicated in acute suppuration. Elevation of the foot of the bed and heat to the extremities are also valuable. Frequent change (every hour) of the patient's position is the most important measure. Change of position and exercise should be continued until the spontaneous activity of the patient is sufficient to accomplish the same purpose. When preventive measures fail, some patients can be saved by prompt recognition and treatment of shock and spasm. Preparations containing papaverine, procaine infiltration of the stellate ganglion and atropine intravenously have been advocated. Operative removal of the embolus has not been generally accepted as a practical procedure. However, a relatively small percentage of these patients are destined to survive (1) because most medical cases occur in cardiac patients in whom the added insult cannot be overcome by the usual measures of combating failure, (2) because, owing to the extremely poor physical condition of some patients, treatment is of no avail, (3) because many patients either die instantaneously, without the doctor present, or so rapidly that there is no opportunity to institute treatment and (4) because some patients have emboli too massive to be affected by nonoperative measures. Until experience with papaverine therapy is increased, prevention is of greater value than treatment.

### West Virginia Medical Journal, Charleston

37:49-96 (Feb.) 1941

Industrial Health: Medical Opportunity. C. M. Peterson, Chicago.—p. 49.

\*Chemotherapy in Acute Bacillary Dysentery: Part II. Clinical Use of Sulfanilylguanidine. G. M. Lyon, Huntington.—p. 54.  
Roentgen Examination of Colon. W. P. Gilmer, Clifton Forge.—p. 66.  
Clinical Uses of Negatan. Edna Myers Jeffreys, Philippi.—p. 71.  
Immediate Metabolic Effect of Benzidine Sulfate in Man. G. A. Emerson and B. E. Abreu, Morgantown.—p. 74.  
Acute Gonococcal Perihepatitis. A. P. Hudgins, Charleston.—p. 77.  
Review of Epilepsy. W. F. Daniels, Huntington.—p. 80.

### Sulfanilylguanidine for Acute Bacillary Dysentery.—

Lyon states that 23 patients with severe or relatively severe acute bacillary dysentery were treated with sulfanilylguanidine and 23 similar patients were used as untreated controls. Among

the patients not receiving sulfanilylguanidine the generally familiar clinical course occurred. Temperatures of from 102 to 105 F. were observed during the first week with severe bloody diarrhea, nausea, vomiting, abdominal cramps, tenesmus, rectal prolapse; in the second week a lower temperature, a continuation of the diarrhea, which became more purulent than bloody, and a loss of strength and body weight; in the third week there was a tendency to a convalescence of varying degrees of severity and tardiness, accompanied by indigestion and loss of strength. The clinical course of 5 of the 23 patients receiving sulfanilylguanidine was not influenced by the drug; 2 of these were accompanied by pyogenic infections. The other 18 patients obtained benefit from the drug. Within twenty-four to forty-eight hours the temperature and leukocyte count fell. The general clinical improvement closely paralleled the fall. There was a reduction in the number of diarrheal stools and equal improvement in their consistency; blood, pus or mucus was absent. This occurred in from twenty-four to seventy-two hours after chemotherapy was begun. In the control group the diarrhea of only 1 patient was checked before the sixth day after admission, in only 2 did this occur before the eighth day after admission, and the stools of 4 continued to be abnormal in the fourth week after admission. There is reason to believe that sulfanilylguanidine is most efficacious in the first three or four days after the onset of fever or diarrhea and that the percentage of failures may be higher when treatment is begun later in the illness. Observations at hand lead to the assumption that sulfanilylguanidine is an effective agent for the treatment of acute bacillary dysentery. While in the dosages recommended (0.1 Gm. per kilogram of body weight for the initial dose and 0.05 Gm. per kilogram every four hours for the maintenance dose and, when there are less than five stools in twenty-four hours, 0.05 Gm. per kilogram every eight hours for from forty-eight to seventy-two hours thereafter) it appears to be a safe therapeutic agent, it should be used with conservatism and conclusions drawn guardedly. Its use is attended with less immediate or remote toxic side effects than that of the related compounds sulfanilamide, sulfapyridine and sulfathiazole. Finally, further clinical use and study are necessary to establish its value in this field.

### Wisconsin Medical Journal, Madison

40:85-168 (Feb.) 1941

Anthrax in Wisconsin. T. E. Wyant and S. Epstein, Marshfield.—p. 101.

Contraction Ring Dysplasia. J. W. McGill, Superior.—p. 105.

Use of Short Wave Diathermy in Study of Peripheral Vasospasm. M. Hardgrove and S. A. Morton, Milwaukee.—p. 108.

Clinical Study of Diethylstilbestrol, a Synthetic Estrogen. A. M. Schwittay, Madison.—p. 111.

\*Encephalomeningitis in Mumps. M. J. Fox, Milwaukee.—p. 113.

Encephalomeningitis in Mumps.—Fox discusses 4 cases of mumps encephalitis and mumps meningitis. He believes that both are best covered by the term "mumps encephalomeningitis." Clinically the syndrome resembles meningitis rather than predominant encephalitis. Four of the author's patients had some degree of parotid gland swelling during the course of the illness. Two patients manifested the complication by convulsions, 3 complained of headache, 3 of gastroenteritis especially with vomiting; all had nuchal rigidity. Spinal puncture disclosed increased intracranial pressure, and all 4 patients had hyperlymphocytosis. The cell counts ranged from 775 to 1,440. The spinal fluid sugars of the 3 patients tested were below normal. Three patients were extremely ill when admitted to the hospital; all made uneventful recoveries, and up to the present writing no sequelae have been reported. The etiology of the encephalomeningitis in mumps appears to be the virus of mumps as shown by the virulence of the Lavergne test. The neurologic changes by the virulence of the Lavergne test. The neurologic changes by the virulence of the Lavergne test. The neurologic changes by the virulence of the Lavergne test. The prognosis of encephalomeningitis of mumps is more favorable than that of the encephalitis of other communicable diseases. The incidence of this complication is not as frequent as indicated in the literature.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Tuberculosis, London

35:1-52 (Jan.) 1941

- Etiology of Subacute Pulmonary Infections: Critical Review of Some Unusual Cases. M. Davidson and P. Ellman.—p. 5.  
Comparison Between the Mantoux Intradermal Test and Tuberculin Patch Test. B. A. Dormer and J. Friedlander.—p. 23.  
Cholesterous Pleural Effusion. G. S. Erwin.—p. 25.  
Naturally Occurring Tuberculosis in Dogs and Some Other Species of Animals. R. Lovell and E. G. White.—p. 28.  
Cystic Emphysema of Lungs with Interstitial Sclerosis. I. Calma.—p. 40.

## British Medical Journal, London

1:145-182 (Feb. 1) 1941

- \*Antiseptic Snuffs. M. E. Delafield, Edith Straker and W. W. C. Topley.—p. 145.  
Diarrheal Diseases in Glasgow. E. Bloch.—p. 151.  
\*Prophylaxis of Throat Infection. R. E. King.—p. 154.  
Mechanism of Partial Rebreathing in Anesthesia. R. L. Wynne.—p. 155.  
Laurence-Moon-Biedl Syndrome with Tetany. F. D'Ahreu and D. Ferri-man.—p. 157.

**Antiseptic Snuffs.**—Delafield and his associates studied the effect of three antiseptic snuffs (proflavin, penicillin and sulfathiazole) in 20 subjects. The following tentative suggestions seem apparent: 1. An antiseptic snuff containing sulfathiazole or penicillin may lessen the frequency of effective invasion of the nose by bacteria or the nasopharynx through the nose. It may therefore prove useful as a prophylactic against bacterial infections of the upper part of the respiratory tract and perhaps against cerebrospinal meningitis. On the latter point there is no direct evidence except that sulfanilamide compounds are active against the meningococcus. The method seems worthy of trial. 2. There is no evidence that it will prevent or cure the common infectious cold. It may favorably affect the course of a cold by preventing secondary bacterial infection. 3. It may prove effective in curing nasal carriers of staphylococci or in reducing the number of vegetative organisms, so that the carrier becomes a less dangerous source of infection to others. 4. It seems desirable to test its possible usefulness in the treatment of nasal carriers of diphtheria bacilli, as the diphtheroids disappeared shortly after treatment was started. 5. How far it will affect other nasal pathogenic organisms there is as yet no evidence. So far the authors have not succeeded in freeing the noses of carriers completely from staphylococci. They have no data as to what happens after treatment with sulfathiazole snuff is stopped. It seems probable that treatment would have to be prolonged to effect any permanent cure and that in cases in which organisms are vegetating in deep crypts or in any of the nasal sinuses an antiseptic snuff would do no more than hold in check the surface colonization. The dispersion of the antiseptic snuff through the nasal passages will probably be similar to that of inhaled bacteria.

**Prophylaxis of Throat Infection.**—King discusses the need of some simple method of prophylaxis against infections of the upper part of the respiratory tract under the present conditions of overcrowding in air raid shelters. The method must be susceptible of being easily applied to large numbers of people. With the object of determining the value of the antiseptic throat spray a 15 to 20 per cent solution of sodium hypochlorite was chosen. Two groups living and working under identical conditions were selected for study. Each morning the group chosen for treatment was subjected to a throat spray until the time of its departure from the establishment some five weeks after joining. During these five weeks the incidence of sickness occurring in the treated group was greatly diminished. The number of patients requiring hospitalization during this period, as well as those receiving ambulant treatment, was reduced by half in the treated as compared with the untreated group. The diminution was due to the decreased incidence of acute and subacute throat infections (streptococcal tonsillitis and pharyngitis). The incidence, severity and duration of common colds (acute coryza) was more or less similar in members of the two groups. This suggests that the prophylactic treatment failed to attenuate the virulence of the infecting organisms in those cases in which they were not primarily

destroyed. The favorable results indicate that the antiseptic throat spray is a justifiable prophylactic measure against such common winter ailments as acute and subacute streptococcal throat infections and influenza.

## Lancet, London

1:131-168 (Feb. 1) 1941

- Practical Evaluation of Gastroscopy. H. Taylor.—p. 131.  
\*Pulmonary Fat Embolism. A. H. T. Robb-Smith.—p. 135.  
Torsion and Inflammation of Appendices Epiploicae. A. D. Le Vay.—p. 141.  
Topographic Difficulties in Detecting Early Foci of Phthisis. G. G. Kayne.—p. 143.  
Treatment of Gonorrhea with Albucid. R. Marinkovitch.—p. 144.  
\*Hereditary Familial Purpura Simplex: Review of Twenty-Seven Families. E. Davis.—p. 145.  
Malignant Hydatidiform Mole Complicated by Torsion of Fibroid. S. A. Way.—p. 146.

1:169-202 (Feb. 8) 1941

- Outbreak of "Pemphigus Neonatorum" in a Maternity Home. S. D. Elliott, E. H. Gillespie and E. Holland.—p. 169.  
Opium as Preanesthetic Sedative in Children. A. H. L. Baker and E. M. Chivers.—p. 171.  
Injury to Central Nervous System by Blast: Observations on a Pheasant. O. W. Stewart, C. K. Russel and W. V. Cone.—p. 172.  
Paratyphoid Abscess: Recovery of Organism from Bone Marrow. A. Macdonald.—p. 174.  
Tellurite Blood Agar Medium for Rapid Diagnosis of Diphtheria. L. Hoyle.—p. 175.  
Beriberi Heart in Young Woman. J. Bates.—p. 176.  
Determination of Blood Volume in Shocked Patients. D. K. Hill.—p. 177.

**Pulmonary Fat Embolism.**—Robb-Smith discusses symptoms of pulmonary fat embolism on the basis of a postmortem study of 115 cases encountered in 789 consecutive accident cases. There was no injury to bone in 12 cases; 5 of these showed gross pulmonary fat embolism and in 6 it was regarded as a significant factor in the fatal outcome. In the 33 cases of skull fracture only 6 showed gross embolism and in 10 there was no embolism. In only 2 was the embolism believed to be important, as the majority had suffered severe cerebral injury. Of 70 cases of other fractures 8 showed no fat emboli, in 30 it was advanced and in 21 it was regarded as the major factor in death. Thus fat emboli were not found in 22, were severe in 41 and were regarded as a major factor in 29. The study demonstrates that it is possible to diagnose the condition which is usually regarded as chimerical. Whether the clinical conditions which follow injuries are due to shock or to fat embolism it must be borne in mind that the two may occur and are distinct, although they can show superficial resemblances. The possibility that fat embolism may follow severe concussion has been recognized for seventy years, yet as far as the author knows it has never been considered a factor following explosions. He suggests that the term "blast injuries" be abandoned in favor of concussion. Pulmonary concussion gives an idea of the pathogenesis and therefore of the rationale of treatment irrespective of the physical agent inducing it. It is conceivable that in injuries due to a bomb explosion the pulmonary parenchymatous hemorrhages induced by the concussion so alter the pulmonary arterial pressure as to produce death in a manner similar to pulmonary embolism. The author thinks that the pulmonary symptoms in bombed cases may be a combination of pulmonary concussion and fat embolism and hopes that pathologists will keep this possibility in mind when making postmortem studies. Should it prove true it may modify treatment. The general procedure in pulmonary concussion and fat embolism is essentially similar, but the effects of fat embolism are progressive and if a specific therapy should be found it would improve the outlook. Symptoms of pulmonary fat embolism arising from injuries come on after a symptom-free interval varying from a few hours to several days. The patient becomes dyspneic, pale, cyanosed and restless and, with little coughing, brings up frothy sputum which may be blood stained. Fat emboli in the systemic circulation may produce purpura or cerebral symptoms (stupor, fits or palsies). The blood pressure does not fall. Early immobilization of injured parts is the most important prophylactic measure. Anoxemia should be relieved with oxygen. Morphine should be avoided. Transfusions of blood or plasma should be withheld when symptoms of fat embolism have developed.



**Hereditary Familial Purpura Simplex.**—Davis adds sixteen families with purpura simplex to the eleven previously reported. Purpura occurred in only one generation in nine of the families, in two generations in twelve, in three generations in five and in one family in four generations. The twenty-seven families now include 88 members with spontaneous skin ecchymoses, of whom 84 were females; the 4 males came from four different families. The 88 cases comprise: 79 with purpura simplex, 4 with Schönlein purpura, 2 with Schönlein-Henoch purpura, 2 in different families who bruised on trivial injury (both suffered from active rheumatoid arthritis) and 1 with pseudohemophilia. Other abnormal hemorrhages were almost completely absent in purpuric members and their relations. In two of the families familial telangiectasia was a feature. Of the 88 persons, 23 gave a history of rheumatic fever, 8 of rheumatoid arthritis, 15 of some other form of arthritis and the others severe fibrositis. In some families the hereditary transmission can be explained on the basis of a dominant gene with partial sex limitation.

### Medical Journal of Australia, Sydney

1:129-158 (Feb. 1) 1941

Halford the Man. A. L. Kenny.—p. 129.

\*Local Implantation of Sulfanilamide for Prevention and Treatment of Gas Gangrene in Heavily Contaminated Wounds: Suggested Treatment for War Wounds. N. J. Bonnin and F. Fenner.—p. 134.

Biochemical Changes in Paralytic Ileus and Intestinal Obstruction. Marjorie Bick and I. J. Wood.—p. 140.

1:159-192 (Feb. 8) 1941

Anatomy of Cerebellum. A. A. Abbie.—p. 159.

Some Notes on Pathology of Cerebellar System. O. Latham.—p. 164.

Physiology of Cerebellum. A. K. McIntyre.—p. 167.

Diagnosis of Cerebellar Disease. S. M. Morson.—p. 172.

Surgery of Intracerebellar Disease. G. Phillips.—p. 176.

Extracerebellar Tumors. I. D. Miller.—p. 179.

**Sulfanilamide Locally for Prevention and Treatment of Gas Gangrene.**—Bonnin and Fenner recommend a procedure for the treatment of war wounds which is based on their experimental work on guinea pigs whose inflicted contused wounds were treated locally with sulfanilamide powder either before or after the wounds were infected with cultures of *Clostridium welchii*, septique and oedematiens, *Staphylococcus aureus*, *Streptococcus pyogenes* and mixed organisms. It is suggested that about 20 Gm. of sulfanilamide (probably in tablets or as compressed granules) be supplied each soldier. This sulfanilamide should be poured into a wound immediately after injury, either by the soldier himself or by a companion, and the first field dressing should then be applied in the usual way. On the soldier's arrival at the casualty clearing station the wound should be excised and again packed with sulfanilamide, whether primary closure is attempted or not. For the local application of sulfanilamide by medical officers, various methods may be used, including insufflation of the powder or the placing of solid pencils of the compressed powder along bullet tracks. For a more rapid rise in the concentration of sulfanilamide in the blood, oral administration of one of the sulfonamides may be advisable at an early stage. The issue of four tablets of sulfapyridine to each soldier would facilitate early administration. Whether it will be possible after excision to close wounds locally treated with sulfanilamide will have to be determined by experience. Provided the wounds are filled with sulfanilamide before closure, the treatment may be safe. This would represent a great advance, for primary closure and union by first intention remain the surgical ideal. If the wounds are left open, repeated local treatment, as used by Levaditi, may be employed. At the Mayo Clinic irrigation with a 0.5 per cent solution and a paste have been used for the purpose. The authors suggest that, if the Winnett-Orr closed plaster treatment of open wounds is used, it should be modified by packing the wound with sulfanilamide before the cast is applied. This will delay bacterial growth and may prevent the early pyrexia which must represent a period of infection and invasion by pathogenic organisms with resulting tissue damage. The authors' experiments suggest that the immediate local use of sulfanilamide prophylactically in all wounds may go far toward preventing bacterial growth and tissue invasion. The effects on pathogenic bacteria of local treatment by other sulfonamides must be studied.

### Presse Médicale, Paris

48:1017-1040 (Dec. 17) 1940. Partial Index

Gold Salt Absorption. A. Lumière and A. Léon.—p. 1017.

Röntgenologic Exploration of Brain Abscesses. J. Piquet.—p. 1019.

Diastolic Murmur in Mitral Stenosis. R. Lutenbacher.—p. 1021.

\*Early Diagnosis of Tuberculosis of Knee in Young Adults. R. Dubau and F. Bolot.—p. 1031.

Renal Osteodystrophia: Case. P. Guye and E. Rutishauser.—p. 1035.

**Early Diagnosis of Tuberculosis of Knee.**—According to Dubau and Bolot, detection of primary tuberculosis of the knee is often a difficult matter, in which diagnostic certainty is afforded only by the laboratory demonstration of the tubercle bacillus. Synovial biopsy may become necessary. The difficulty of diagnosis is illustrated by the fact that 37 out of 106 cases diagnosed as free from tuberculosis of the knee had to be observed for months and even for years to establish the diagnosis. (The value of early diagnosis lies in prompt immobilization of the tuberculous knee.) In 37 of these cases associated tuberculous lesions were found before or after articular localization. Of these, twenty were single (pulmonary tuberculosis six times, Pott's disease four times) and fifteen were multiple lesions. Skeletal lesions seen in the roentgenogram consist in decalcification and possess practically no differential value. Likewise, bone degeneration appears too late to aid diagnosis. It is only in the soft tissues that roentgenoscopy is revelatory. Here edema and infiltration present a dirty opaqueness, especially when both knees are roentgenoscopically contrasted. The appearance of the synovial cul-de-sac in the roentgenogram is an important though not a conclusive sign. In the early stages of the disease, this cul-de-sac is empty and only its parietal outline is traceable in the film. The identification of the tubercle bacillus may be done directly from the intra-articular fluid, or the synovial wall, or culturally or by inoculation. The first is rarely positive. Macroscopically, synovial biopsy is of little value. Its microscopic evidence is greater, but by no means pathognomonic. The bacteriologic test effected by inoculating guinea pigs was positive in eleven out of thirteen biopsies performed and negative in the remaining two. In 8 cases both microscopic and bacteriologic tests yielded proof of the presence of the bacillus. The authors stress the fact that synovial biopsy with the aid of modern technical resources is devoid of danger but should be employed only when the bacillus cannot be demonstrated otherwise, either in situ or in a tuberculous lesion localized elsewhere.

### Policlinico, Rome

47:429-468 (Nov. 1) 1940. Med. Sec. Partial Index

Action of Sulfanilamide Derivatives on Leukocytes. L. Donatelli and A. Papini.—p. 429.

\*Behavior of Draining Bronchi During Cavity Aspiration. S. Chiodi and M. Gemmi.—p. 454.

**Bronchi During Cavity Aspiration.**—Chiodi and Gemmi of the Forlanini Institute studied the condition of the draining bronchi in the course of cavity aspiration in 50 cases. They injected iodized oil into the cavity by way of the intrathoracic catheter. The quantity of oil necessary to fill the cavity and the bronchi diminished as the treatment progressed. In the early stages of the treatment a cavity may be without a patent bronchus, or it may possess closed bronchi which may open on postural change or by the impulse of a cough, or it may possess large draining bronchi. The cavity may be either single or in communication with another cavity. The intracavitary, pericavitary and extracavitary bronchi frequently present dilatation. The size of the cavity becomes greatly reduced in the course of the treatment. At this stage the cavity may be without a draining bronchus or the bronchi may be undergoing progressive narrowing and closure, which can be verified roentgenologically, or, on the other hand, the bronchus or the bronchi may remain patent throughout the treatment. When the cavity is entirely obliterated the bronchi draining it are apparently closed. The clinical condition of the patient corresponds to the phase of the disease as shown in the roentgenograms. Patency of the bronchi after the supposed obliteration of the cavity is an indication for continued suction. The existence of bronchiectasis or of a fistula of the tract occupied by the catheter can be ascertained by roentgen examination with the aid of iodized oil.



**Archiv für klinische Chirurgie, Berlin**

200:1-655 (Oct. 18) 1940. Partial Index

- Circulatory Disturbances After Brain Surgery. W. Tönnis.—p. 179.  
\*Posttraumatic Pressure on Brain. F. J. Irsigler.—p. 202.  
Clinical Value of Temporary Exclusion of Stellate Ganglion. D. Philipides.—p. 227.  
Extirpation of Pulmonary Lobe. E. K. Frey.—p. 238.  
\*Changes in Treatment and Estimation of Vertebral Fractures. L. Böhler.—p. 281.  
\*Functional Treatment of Vertebral Fractures or Böhler's Reduction. H. Burkle-de la Camp.—p. 321.  
\*Conservative and Surgical Treatment of Ureterolithiasis. H. Boeminghaus.—p. 487.  
\*Hormone of Thymus. C. Bomskov.—p. 567.  
\*Clinical Consideration of Thymus Hormone. E. Rehn.—p. 589.

**Posttraumatic Pressure on the Brain.**—Irsigler characterizes the changes which the posttraumatic brain pressure produces in the brain itself and on the liquor spaces as follows: 1. Posttraumatic brain pressure develops in the majority of cases on the basis of a reactive brain swelling which develops from a collateral edema around the traumatic lesion and which may gradually extend over the entire hemisphere. 2. This cerebral swelling as a rule produces clinical signs of a generalized increase in brain pressure three or four days after the trauma. Pressure symptoms which appear within the first two days or even within the first twenty-four hours after the injury are nearly always caused by an intracranial hematoma. Although practically the same form changes and mass deviations are produced by the cerebral swelling and by the pressure resulting from intracranial hemorrhage, the difference in time between the appearance of the symptoms of these two types of pressure is one of the most important factors in the differentiation of these two traumatic sequels. 3. Brain injuries may be followed by incarceration in the tentorial notch with pressure on the brain stem and the quadrigeminal plate. The result is a compression of the aqueduct of Sylvius with hydrocephalus of the ventricle. The incarceration explains also certain symptoms of the midbrain such as anisocoria or disturbances of the conjugated eye movements, which occur in persons with brain injuries. Unilateral pupillary dilatation and unresponsiveness to light is not always indicative of an intracranial hemorrhage; it is merely a sign of pressure on the tentorium of the midbrain, and thus it may accompany cerebral swelling as well as hemorrhage.

**Treatment of Vertebral Fractures.**—Böhler demonstrated in 1930 that by the reduction of vertebral fractures the lumen of the vertebral canal and of the vertebral foramina can be restored, and that in this manner the paralysis is avoided in all cases in which the continuity of the cord has not been severed. Many observers have reported good results from this method. It is superior to laminectomy, because it is less complicated and involves no danger of infection. Böhler made careful studies on more than 60 cadavers in which vertebral fractures had caused paralysis. He observed the effects of longitudinal extension, ventral suspension and dorsal suspension. Böhler classifies the vertebral fractures into: 1. Cases without deviation, in which the paralysis is due to concussion, hemorrhage or edema. In these cases the paralysis disappears spontaneously. 2. Cases with pronounced anterior dislocation of the cranial fragment in which the vertebral arch is preserved. In these cases the spinal cord is crushed, and reduction, like any other treatment, is without avail. 3. Cases with unilateral or bilateral fracture of the arch in the interarticular portion. In these cases there exists usually only compression, not severance of the cord, and they are suitable for nonsurgical reduction. 4. Cases with comparatively slight dislocation and hooking of the articular processes in which the spinal cord is usually preserved. These can be reduced in ventral or dorsal suspension after previous partial resection of the articular processes. With regard to vertebral fractures without paralysis, Böhler states that before 1929 he applied a plaster bed in hyperextension and gradually reduced the gibbus as in spondylitis. A report by Davis, an American author, convinced him that immediate reduction is preferable. Böhler employed reduction and subsequent fixation in a plaster cast, but instead of keeping patients in bed with a cast he lets them up and makes them do gymnastic exercises to avoid muscle atrophy. The treatment embodies the same three principles of reduction, fixation and exercise which govern the treatment of bone

fractures in general. To Magnus's objection that the vertebral body may later collapse and that the length of time the cast has to remain in place is a disadvantage, Böhler replies that for fractures without paralysis the immobilization requires on the average less than four months, and for fractures with paralysis on the average six months. Breaking down of the vertebra does not occur if the reduction was complete and was done within the first few days after the accident. It may occur if the reduction was done late or if the fixation was of insufficient duration. To Magnus's charge that the method is expensive, time consuming and annoying to the patient, Böhler replies that reduction is done on the first day and that the patients are up and exercising on the second day. Patients in whom the fracture is not complicated by paralysis and whose occupation does not involve hard physical labor can leave the hospital after seven days and resume their work during the second week. After six weeks, when patients treated by the method of Magnus begin to walk with the aid of supports, Böhler's patients already carry weights of from 20 to 40 Kg. on their heads. Unreduced vertebral fractures are generally extremely painful for a number of days, whereas, when the fracture is reduced, the patient is free from pain provided the reduction is complete and the plaster jacket fits well. The exercises create self confidence and pride in performance. This can be attested by thousands of physicians who have visited Böhler's clinic and have observed the patients.

**Functional Treatment of Vertebral Fractures.**—Burkle-de la Camp discusses the relative merits of the Böhler treatment of vertebral fractures by reduction, fixation in plaster and exercises, and the functional treatment defended chiefly by Magnus. In the functional treatment the patient is kept recumbent on a thin mattress under which a board is placed. Sand bags are used to effect a gradual reduction of the hump if the gibbus is considerable. During the first two weeks the patient lies on his back but is permitted to lie on a side for short periods. Heat is applied by means of a heating pad. From the third week on heat is applied with the patient in the prone position and the musculature of the back, excluding the region of the fracture, is massaged. With the beginning of the fifth week the patient is raised to sit up in bed at meal time; this is gradually increased to a regular exercise. After six weeks the patient gets up and is usually able to bend over without holding the vertebral column stiff. Gymnastic exercises are begun. The patient is able to work after an average of one hundred and thirteen days. In the less severe injuries the time required for treatment is shorter (from six to seven weeks). The author analyzes the results obtained in a hospital in a mining region, in which during one year 230 fresh vertebral fractures were treated and in which annually from 500 to 600 old vertebral fractures were reexamined. He employed the technic which Böhler has outlined in the latest edition of his book on fractures. He concludes that it is possible to reconstruct a broken vertebra, that such a vertebra will bear loads and that the function of the vertebral column will be completely restored. Some of these vertebrae, however, will break down in spite of the reduction and sufficiently prolonged fixation. After the reduction treatment there is a greater loss of elasticity than is the case with the functional treatment. The reduction treatment does not produce a more rapid improvement in the paralysis; it may even produce or intensify paralysis, because a bone fragment or a portion of the intervertebral disk may enter the vertebral canal and exert pressure on the cord. The prolonged wearing of a plaster jacket often weakens the patient besides producing unfavorable psychologic effects. The reduction treatment did not prove advantageous in the author's material. He considers prevention of gibbus formation an insufficient justification for Böhler's treatment and considers the functional treatment best.

**Conservative and Surgical Treatment of Ureterolithiasis.**—According to Boeminghaus the majority of ureteral calculi are discharged spontaneously or with conservative or instrumental aid. The evaluation of the consecutive methods is difficult, because it is almost impossible to determine whether the stone could not have been discharged spontaneously. Instrumental removal of ureteral calculi usually consists in the employment of the loop catheter. It is highly gratifying

to be able to relieve a patient, tortured by colic and fever and threatened with severe renal impairment, by a simple cystoscopic procedure. Even in cases in which spontaneous expulsion appears likely the instrumental removal of the stone will save the patient days or weeks of suffering and considerable renal damage. There is no other condition in which the art of instrumental treatment is associated so intimately with major surgery as in the treatment of ureteral stones. The greater the mastery over the conservative methods, the smaller is the number of surgical interventions. In case of complete obstruction, the removal should not be postponed for more than two or three weeks. It is erroneous to estimate damage produced by stasis on the basis of the dilatation of the renal pelvis alone. If blockage is associated with urinary infection, the situation is urgent. If the urine can flow alongside the stone, an expectant attitude is permissible but reexaminations become necessary. Increase in dilatation, lowered renal function and a complicating infection make prompt removal of the stone imperative. The higher the ureteral obstruction, the greater and more rapid the destruction of the kidney. The misgivings about surgical intervention for ureteral stone are often unduly exaggerated. The necessity for such an intervention is determined by the duration of symptoms, the degree of urinary stasis, the type and intensity of urinary infection and the extent of the functional impairment of the kidney. Consideration of the opposite kidney is important. The presence of a ureteral stone is especially dangerous if the other kidney has already suffered. The decision as to when renal damage becomes irreparable, so that nephrectomy is necessary, should not be schematic. The author is of the opinion that there is too great a tendency to perform radical operations when kidney-preserving interventions, such as a temporary renal fistula, would accomplish the aim. Roentgenoscopy should be made immediately preceding the intervention, because the stone may have altered its position. The incision should not be too small. The ureter should always be opened in the longitudinal direction, because an extensive longitudinal incision is less harmful than a short transverse one. The patency of the ureter must be explored after extraction of the stone. In cases in which a ureteral stone exists on one side and a renal stone on the other, the ureteral stone should be removed first, because it is more harmful to the organism. In the case of bilateral ureteral calculi or of a patient with one kidney and a ureteral stone, there is present the danger of anuria. Surgical removal in such cases must be resorted to within twenty-four to thirty-six hours after the development of anuria.

**Hormone of Thymus.**—Bomskov claims to have discovered the hormone of the thymus. Investigations by Bomskov and several collaborators began with studies on the utilization of the hypophyses of whales in the pharmaceutical industry. The whale hypophyses were examined for their hormone content, and comparative tests were made on the hypophyses of cattle. There are five known hormones of the anterior hypophysis: the thyrotropic, gonadotropic, lactotropic, growth and diabetogenic hormone. The first three are comparatively well known. The investigators gave their attention chiefly to the last two. Evidence was produced which made it probable that the growth hormone and the diabetogenic hormone are identical. Further studies aimed to determine whether the growth (diabetogenic) hormone exerts its action directly or whether it is a "tropic" hormone, that is, one which acts by way of some secretory gland. Studies were undertaken to determine whether this hormone is active in thymectomized animals. Roentgen rays were used to effect a practically complete destruction of the thymus tissue. In animals subjected to such roentgen irradiation of the thymus the diabetogenic (growth) hypophysial hormone proved to have no effect on the hepatic glycogen, suggesting that the action of the hormone is dependent on an intact thymus, or, expressed differently, the hormone is the thymotropic hormone of the hypophysis. The identification of the thymotropic hormone led to a search for the thymus hormone. Experiments with a lipid extract of the thymus demonstrated that the thymus hormone is a lipid substance. The thymus hormone produces intense growth in animals. It is effective in hypophysectomized rats and produces diabetes. A single injection of the hormone produces

pronounced lymphocytosis and leukocytosis. Continued injection, over a period of several weeks, causes involution of the male gonads and their adnexa. All these effects of the thymus hormone, which can be produced also with the thymotropic hormone of the anterior pituitary, but only in the presence of an intact thymus, are manifestations of infantilism (intense growth, lymphocytosis, smallness of gonads and low glycogen content). Investigations on the formation and action of the thymus hormone disclosed that lymphocytes, after they have been formed in the lymphatic tissues, are attracted toward the thymus. Passing through the medulla of the thymus, they are charged with the thymus hormone. These charged lymphocytes are stored in the cortex of the thymus, are discharged into the lymph stream as needed and are carried to the sites where their action is required. The author compares this mode of action with conservation in cans. The cans (lymphocytes) are produced in the lymphatic tissues; filling of the cans takes place in the thymus, which represents the canning factory, from which they are carried to places where their contents are consumed. The thymus hormone differs from other hormones in that it is not dissolved in the plasma but is carried by the lymphocytes. The author developed a method which makes possible the detection of thymus involvement in various disorders. It enables him to detect in 50 cc. of urine the thymotropic hypophysial hormone as well as the thymus hormone.

**Clinical Consideration of Thymus Hormone.**—According to Rehn, hyperfunction of the thymus leads to disease if it disturbs the hormonal equilibrium required by the age and vital functions of the subject. He directs attention to certain changes in the liver and heart, particularly to glycogen deficiencies in these organs; also to the relation between thymus, thyroid and gonads at birth and at puberty. He suggests that hyperfunction of the thymus at puberty probably plays a part in acromegaly and eunuchoidism. Status thymicolymphaticus, that is, infantilism, can be induced by means of the thymus hormone. The author pays particular attention to the role of the thymus in exophthalmic goiter and points out that in patients with this condition the function of the thymus should be tested as well as the basal metabolism. Glycogen deficiency in the liver of patients with carcinoma led to studies on the thymus function of such patients and disclosed hyperfunction. Since the lymphatic system plays an important role in transporting the thymus hormone, it seemed desirable to test the thymus function in a disease seriously involving this system, namely in Hodgkin's disease. Tests on patients with Hodgkin's disease revealed such a severe hyperfunction of the thymus that a hormonal disturbance must be accepted, although its primary or secondary character cannot be determined as yet.

#### Münchener medizinische Wochenschrift, Munich

87:1257-1288 (Nov. 15) 1940. Partial Index

- Gruber-Widal's Reaction and Immunization Against Typhoid. R. E. Bader.—p. 1257.
- Natural Estrin and Synthetic Estrogenic Substances. Lange-Sundermann.—p. 1260.
- Action of Vitamins. W. Alter.—p. 1262.
- Physiologic Action of Natural Nicotine-Free Tobaccos. A. Wenusch and Gerda Maier.—p. 1263.
- \*Old and New Aspects of Successful "Lightning" Cure (Therapia Sterilisans Magna) Even in Long Existing Secondary Syphilis. E. Hoffmann.—p. 1264.
- Use of Ultraviolet Rays for Sterile Operations. E. Hasché.—p. 1268.
- Results of Moro's Reaction at a Munich Grade School. K. Sixt.—p. 1272.

**Rapid Treatment of Syphilis.**—Hoffmann discusses the massive dose chemotherapy of early syphilis by the intravenous drip method. He points out that Americans compare this method only with the continuous alternating treatment, which requires at least two years, but not with the method of Hoffmann, which consists of maximal early treatment with simultaneous exhibition of neoarsphenamine or sodium arsphenamine and a bismuth compound in from one to three courses of treatment. With this method the spirochetes usually disappear from the cutaneous and mucous membrane lesions after twenty-four hours and the serologic and clinical signs subside quickly. The arsphenamine drip method represents nothing new, whereas its great inconvenience and the frequency of threatening toxic manifestations make its employment inadvisable. A real "lightning" cure of the type of therapia sterilisans magna is possible in three days

by means of the originally practiced intragluteal application of arsphenamine, particularly in the form of the "double shot." The author cites the history of a man who in 1910 developed a severe secondary syphilis which relapsed after simple inunction treatment. Months later, when he had a severe papulo-ulcerous syphilis with severe syphilitic angina, the patient decided to undergo arsphenamine treatment. Arsphenamine was injected intravenously and an intragluteal injection was given three days later. The rapid disappearance of all signs of syphilis proves that this double shot method, in which the intragluteal "catch shot" is especially important, will cure within three days not only early syphilis but also old cases. The author reviews 5 similar cases. He prefers sodium arsphenamine to other preparations. The 6 reported cases in which "lightning" cures were obtained by the intragluteal administration of arsphenamine were observed for from eighteen to thirty years. The violent therapeutic inflammation in the muscle seems to play an important part in this form of chemotherapy. The intravenous administration of arsphenamine with and without mercury has likewise produced excellent permanent results, particularly if adequate single doses are repeated with sufficient rapidity. The so-called double shot (intravenous plus intragluteal) has produced the best results in the author's experience. The development of the combined early treatment with neoarsphenamine and sodium arsphenamine and a preparation containing basic bismuth salicylate has made it possible to dispense with arsphenamine for early cure. The one to three course system insures permanent cures in nearly 100 per cent of the cases of primary and secondary syphilis, if sufficiently large single and weekly doses are administered and if the intervals between courses are short (four to five weeks). This has been proved by follow-up observations with serologic tests over periods of from two to three decades.

#### 87:1289-1316 (Nov. 22) 1940. Partial Index

- \*Organic Angina Pectoris Electrica. S. Koeppen.—p. 1289.  
Treatment of Infectious Meningitis with Sulfanilamide and Sulfanilamidopyridine Preparations. A. Gebauer and B. Rating.—p. 1293.  
Examination of Circulatory Function in Daily Practice. K. Reimer.—p. 1305.  
Focal Treatment of Leprosy. F. Röpke.—p. 1308.

**Organic Angina Pectoris Electrica.**—Koeppen observed 93 cases of electrical accidents that were followed by cardiac disturbances. He first presents cases in which the electrocardiographic record disclosed a coronary insufficiency combined with disturbances of the cardiac function. In a second group of cases the electrical accident was followed by auricular fibrillation and flutter. All of these latter patients were comparatively young. Further the author presents a group of cases which, like those in group 2, present disturbances in the cardiac conduction. To clarify the development the author investigated the site of attack of the electrical energy on the heart in animal experiments. He also directs attention to investigations by American workers who demonstrated that the cardiac defects, particularly the ventricular fibrillation, can be elicited by electrical irritation only during the so-called relative refractory phase, whereas in the case of irritations during the absolute refractory time the electrocardiogram discloses no disturbances. The author offers as an explanation for this that during the relative refractory phase the resting action currents of the heart are covered up or disturbed by the technical current and that thus the conduction of the stimulus, the subsequent stimulation of the auricles and ventricles cannot be effected. He thinks that his own experiences and those of the American authors permit the conclusion that an electrical injury of the heart can be accepted only if the accident was immediately followed by cardiac disturbances, but that anatomically demonstrable changes cannot be expected because the current acts only an extremely short time. In the summary he states that 16 of his 93 cases presented the aspects of organic angina pectoris electrica. This disorder is due to an impairment of the stimulus conduction system; that is, of the formation of the stimulus as well as of its course. Electrocardiographically, the disorder presents itself (1) as a coronary insufficiency, (2) as an auricular fibrillation and (3) as disturbances in the conduction of the stimulus. The author regards electrical angina pectoris as a result of direct electrical action on the cardiac conduction system.

### Wiener klinische Wochenschrift, Vienna

53:929-954 (Nov. 15) 1940

- Clinical Aspects and Therapy of Circulatory Disturbances in Bronchospasm. N. von Jagić.—p. 929.  
Elastic Walking Bandage and Foot Mechanism. H. Matheis.—p. 933.  
\*Lipoid Extracts in Therapy of Heart Disease. E. Albrich.—p. 935.  
Requirements for Successful Irradiation of Malignant Tumors. J. von Palugay.—p. 939.

**Lipoid Extracts in Therapy of Heart Disease.**—Albrich points out that Latzel and later Thaler used lipid extracts successfully in the treatment of lesions of coronary vessels. The lipid extracts are prepared from several organs. The author employed the cardiac type in combination with the aortic and occasionally the cerebral type. According to Latzel's suggestion, the preparations are administered intracutaneously (corresponding to Head's zones), usually parasternally, in the second and third intercostal space. Albrich maintains that these lipid extracts can be successfully employed (1) in calcifications of the coronary vessels and its sequels, especially in myocardial infarct and in chronic myocarditis; (2) in acute myocarditis that can be traced to a focal infection; (3) in essential hypertension with decompensated heart and encephalomalacic foci; (4) in decompensated organic heart defects (as supporting therapy), and (5) in cases of cardiac myodegeneration. The author reviews the histories of 5 patients with calcification of the coronary vessels. Cases of this type can be treated successfully by diet and lipid extracts. That the efficacy of this treatment is not due to suggestion was proved by test injections of physiologic solution of sodium chloride. In 2 cases of tonsillogenic myocarditis the customary treatment was not dispensed with and, after the cardiac status had improved, the focus was removed; but here too lipid therapy proved to be a valuable adjuvant. It was found that blood pressure could not be modified in patients with essential hypertension and cardiac failure by the lipid extract alone. Hospitalized patients were given a restricted diet, digitalis and pressure reducing substances, but even in these patients the author does not want to dispense with two or three weekly injections of the lipid extract. Injections of lipid extract are continued for several weeks after compensation has been restored. Decompensated organic heart defects must be treated with strophanthin and digitalis. In these cases, as well as in those of myodegeneration, the authors regard the lipid extract as an adjuvant.

### Taiwan Igakkai Zassi, Taihoku, Formosa

39:1947-2062 (Dec.) 1940. Partial Index

- \*Stool Examinations in Elementary School Children, with a Note on Santonin Treatment. M. Ro.—p. 1975.  
\*Clinical Studies of Bronchial Asthma. K. Yogi.—p. 1989.

**Santonin for Ascaris.**—Ro examined the stools of 465 elementary school children in an agricultural area in northern Formosa and discovered the highest rate of any one infestation to be that of *Ascaris lumbricoides* (85.35 per cent in males, 89.10 per cent in females), followed by *Trichocephalus trichiuris* (78.75 per cent in males, 68.58 per cent in females) and hookworm (23.73 per cent in males, 15.38 per cent in females). Among the pathogenic protozoan infections in the lower range of frequency were *Giardia lamblia* (15.15 per cent in males, 12.82 per cent in females) and *Endamoeba histolytica* (3.03 per cent in males, 1.92 per cent in females). The results of these examinations revealed 70.05 per cent of children infected with helminths without protozoa, while only 0.84 per cent were infected with protozoa without helminths. Mixed infection with both helminths and protozoa was encountered in 25.14 per cent of children; the combination most frequently seen was *Ascaris*, *Trichocephalus* and *Giardia*. A single administration of santonin, in doses varying from 0.03 to 0.05 Gm. according to the age of the child, followed two hours later with a 10 per cent infusion of senna leaves mixed with 40 per cent of magnesium sulfate (24 to 30 cc. diluted with water to 150 to 200 cc.) produced a complete cure in 50 children (22.43 per cent) and the satisfactory expulsion of 1,439 ascarids in 362 children (77.84 per cent). The ratio of male worms expelled was 39.16 per cent.

**Bronchial Asthma in Formosa.**—Yogi analyzed 420 cases of bronchial asthma seen during a six year period in Taihoku, a city in northern Formosa having a subtropical climate. As

compared with the published reports of incidence of asthma in Japan proper, the author found here a higher morbidity rate, especially during the season characterized by high humidity (from October to May). The condition is more frequently seen in Japanese who migrated to Formosa and became afflicted with the disease during the first four years or during the period of acclimatization. Men are most susceptible to the disease in the age period between 26 and 30 years, and women between 16 and 20 years. No difference was noted in the possible hereditary and sex factors as compared with reports from other countries. In the majority of patients with bronchial asthma, allergic cutaneous reactions were positive, the rate of positive reaction being higher in asthmatic than in normal subjects. As a rule normal subjects react positively to a single allergen, while the asthmatic patients usually show positive reactions to several allergens. As compared with the nature of cutaneous reactions in asthmatic patients in Japan proper, patients in Formosa appear to be more highly sensitive in cutaneous reactivity. The incidence of positive cutaneous tests for fungus and yeast were especially high among the asthmatic and even among normal subjects, suggesting the potency of the microbiologic flora of Formosa, to which the inhabitants are constantly exposed. The Prausnitz-Küstner tests and the provocative tests often produced results at variance with each other; these tests are to be used merely as an adjunct in clinical diagnosis of asthma and not as a means of explaining the nature of the disease.

### Sovetskaya Meditsina, Moscow

Pp. 1-48 (No. 19) 1940. Partial Index

Vitaminology and Problems of Health Preservation. L. A. Cherkas. —p. 3.

Significance of Vitamin C in Physiology and Pathology of Child's Organism. Yu. F. Dombrovskaya. —p. 6.

Comparative Evaluation of Oral and Intravenous Methods of Saturation with Vitamin C. G. A. Baksh. —p. 19.

Infectious Jaundice in Children. M. B. Geodakyan. —p. 19.

\*Subcutaneous Injections of Oxygen in Therapy of Lesions of Respiratory Organs Caused by Irritating Gases. I. Ya. Sosnovik. —p. 22.

**Subcutaneous Oxygen for Toxic Bronchitis from Gases.**—Sosnovik reports 61 cases of toxic bronchitis, bronchiolitis and bronchopneumonia caused by irritant gases in various industries and treated by subcutaneous injection of oxygen. Nitric acid fumes, phosgene, chlorine and chlorpicrin were the offending substances. Oxygen was introduced subcutaneously in amounts varying from the initial dose of 200 cc. to 1,000 cc. every other day; in cases of pneumonia and bronchopneumonia 1,000 cc. was injected daily. The immediate effect was that of improvement in the subjective feeling, followed by diminution of cough, the sensation of tightness in the chest, dyspnea and the amount of sputum, with improvement in appetite and sleep. Oxygen therapy appeared to exert an analgetic and sedative effect. The author regards it of value as a supplementary measure in the treatment of acute and subacute bronchitis caused by irritating gases. The therapy was without any effect in chronic toxic bronchitis.

### Nordisk Medicin, Stockholm

8:2121-2210 (Nov. 23) 1940. Partial Index

#### Hospitalstidende

Differential Diagnosis Between Pulmonary Tuberculosis and Pneumonia: Illustrated by Larger Material. S. Holm and K. Winge. —p. 2121.

\*Occurrence of Aseptic Complications in Central Nervous System in Scarlet Fever. H. C. A. Lassen and J. Bang. —p. 2130.

**Aseptic Complications in Central Nervous System in Scarlet Fever.**—Lassen and Bang report that, of 9,826 cases of scarlet fever treated at the Blegdani Hospital from 1934 to 1940, 20 (0.2 per cent) presented symptoms of complications in the central nervous system. There was increased number of cells, predominatingly lymphocytes, in the spinal fluid in all cases; in 6 cases the pleocytosis was the only sign of the disorder of the central nervous system. In 10 there were clinical signs of meningitis without focal symptoms; in 4 there were focal symptoms. The prognosis was good in all cases. The complications are ascribed to a virus infection which is, however, not believed to be of "poliomyelitic" kind, although 16 of the cases occurred during the months from August to Novem-

ber. The authors found no demonstrable correlation between the occurrence of these aseptic infectious disorders of the central nervous system and scarlet fever with neurologic symptoms.

#### Hygiea

\*Mesenterial Pyemia in Connection with Appendicitis. H. Rosenqvist. —p. 2159.

**Mesenterial Pyemia with Appendicitis.**—Rosenqvist says that the picture of mesenterial pyemia is characterized by chills and signs of disturbance of the liver. Mesenterial pyemia may occur, usually in men between 20 and 50, in spite of early operation for appendicitis. Chills in appendicitis are an absolute indication for immediate operation. If on operation thrombosis is found in the mesenteric lumen, the mesenteric lumen must be resected as extensively as possible. If thrombi extend to a greater degree in the proximal direction, ligation of the ileocolic vein should be tried. In threatening pyemia immediate antiseptic treatment with sulfonamide derivatives and heparinization are important. Three personal cases are reported.

8:2211-2302 (Nov. 30) 1940

#### Hospitalstidende

\*Annular Pancreas. F. Truelsen. —p. 2226.

**Annular Pancreas.**—Truelsen says that he observed this anomaly, the first to be published in Scandinavian literature, in a man aged 35 with a history of periodic mild gastric attacks for years; aggravation of the attacks and lessening ability to work led to hospitalization. The roentgen diagnosis was duodenal diverticulum. Operation disclosed an annular pancreas with marked dilatation of the duodenum above it. Duodenorrhaphy was done, with gastroenterostomy. Half a year after the operation the patient was without symptoms and fully able to work. The author finds 43 cases of annular pancreas, in both sexes and all ages, recorded in the literature, with more or less marked symptoms of high intestinal obstruction described in 16; operation was performed in 7 cases; the remaining were diagnosed at necropsy. In most cases, he says, an annular pancreas may give few or no symptoms for years or through life. When surgical treatment is indicated, an anastomosis should be the method, probably a gastroentero-anastomosis, in cases of marked dilatation perhaps a duodeno-jejunosomy, or, as in his case, a gastroenterostomy with duodenorrhaphy, to hinder continued retention in the duodenal sac.

#### Norsk Magasin for Lægevidenskapen

\*Peduncular Brain Stem Syndrome. K. Kristiansen. —p. 2241.

**Peduncular Brain Stem Syndrome.**—A man aged 53, had had hemianopic disturbances in vision of migraine-like character setting in many years earlier, then symptoms, at first transitory, of a disturbance which, viewed in retrospect, is assumed to have been the first manifestation of the lesion in the right dorso-rostral part of the brain stem which was established later. Kristiansen says that dissociated loss of sensibility, hyperpathia and spontaneous pain indicate that the thalamus must also have been affected somewhat early in the course. The last ten or twelve years of the patient's life were most marked by epileptiform manifestations, diplopia as the result of paralysis of the oculomotor nerve, first on the right side, later also partly on the left side, grotesque involuntary movements in the left upper extremity preeminently appearing as hemiballism and, finally, disturbing sensory phenomena on the left side. About the time of the onset of the peduncular symptoms the patient, formerly silent and taciturn, became talkative and cheerful. Death was due to bulbar symptoms. There was a crossed brain stem syndrome, distinguished from the ordinary vascular hemisindrome by the extension of the lesion to the other side of the middle line. The author finds that the post-mortem establishment of an expansive process in the form of a cavernous hemangioma justifies not accepting a purely vascular genesis in such cases but considering the probability of a neoplasm. The hemiballism was due to a lesion of the sub-thalamus. With regard to the psychic changes which may appear in patients with disorders in the rostral part of the brain stem the tendency to affective instability is stressed. To what extent the migraine-like symptoms in the case were connected with the lesion of the brain stem is uncertain.

## Book Notices

**Military Medical Manual.** Foreword by Major General James C. Magee, the Surgeon General, U. S. Army. Fourth edition. Cloth. Price, \$4.50. Pp. 877, with illustrations. Harrisburg, Pa.: Military Service Publishing Company, 1940.

This edition brings up to date information on subjects of interest to officers of the Medical Department of the Army. The sources of the subject matter are the official publications of the War Department and instructional material published by the general and special service schools. Part one deals with purely military subjects, such as the composition of the Army, mobilization planning, supply and evacuation of military units, defense against chemical warfare, map reading, interpretation of aerial photographs and the care and operation of motor vehicles. Part two deals with medical subjects. Of particular interest is the chapter devoted to the history of the evolution of the Medical Department of the United States Army. By the act of Congress in 1818 there was created a Medical Department of the Army, a Surgeon General was appointed and a central organization was set up. This marks the transition from the individual, haphazard and largely inadequate medical service to one of central organization and definite progress. It is indeed a record to be proud of. The Army was one of the first organizations to put many of the modern health measures into practice with demonstrable success. Among these may be mentioned routine immunization against typhoid, smallpox and diphtheria, and the control of venereal disease. The Army Medical Department established opportunities for and encouraged research. It had added, in the course of years, many an illustrious name to the roster of pioneers in the fields of bacteriology and sanitation. Thus, Major C. R. Darnall originated and devised a method of purifying water by means of chlorine. Major Walter Reed demonstrated the transmission of yellow fever by the mosquito, and Col. William Gorgas had eradicated the yellow fever and had thus enabled our Engineer Corps to accomplish the engineering feat at which the French had failed—the building of the Panama Canal. Compulsory vaccination against typhoid was introduced in 1911. Bacteriology was not the only science advanced by the Army Medical Department. The first American experimental physiologist was a surgeon in the United States Army, William Beaumont. The success in research work is due to the well trained personnel, who are encouraged to carry on their investigations, and to the fact that the Army has large groups of men under control which facilitates investigation and permits follow-up of the results. Thus the Army Medical Department has been able to make many advances in medicine that have been of service to humanity. A Medical Research Coordinating Board was appointed Jan. 15, 1940 to facilitate research problems in the Army. An invaluable gift to medicine is the creation of the Army Medical Library, the largest and greatest medical library in the world. The remaining chapters in part two deal in considerable detail with such subjects as field sanitation, military preventive medicine, military hygiene, first aid, aviation medicine and chemical warfare. Part three contains detailed information regarding the tactical employment of medical units in the field, administration, supply and mess management. The existence of an emergency, with the consequent increase of the medical personnel of the Army, makes the appearance of the fourth edition of this excellent manual timely and welcome.

**The 1940 Year Book of Physical Therapy.** Edited by Richard Kovács, M.D., Professor and Director of Physical Therapy, New York Polyclinic Medical School and Hospital, New York. Cloth. Price, \$2.50. Pp. 464, with 149 illustrations. Chicago: Year Book Publishers, Inc., 1940.

This is the third edition of the Year Book of Physical Therapy. Although it is the newest of the series of year books, this yearly volume on physical therapy has amply proved its value. As in previous years, the book has been edited by Dr. Richard Kovács, whose wide experience and knowledge of many languages admirably suit him for the work of compiling the available yearly information on the subject of physical therapy. The fortieth anniversary of the Year Book series is now being

celebrated, and the editor in recognition of this fact has inserted an introductory article on the treatment and management of arthritis. Throughout the text, from this introductory article to the final section on applied physical therapy, there will be found much valuable material of interest not only to the specialists in physical therapy but also to the general practitioner and to specialists in many other fields. It is stated that the aim of the book is "to present side by side all organized methods of physical treatment and to stress on all occasions that they are only parts of the extensive field of general medicine." An inspection of the contents of the book reveals that this aim has been accomplished. Methods of treatment are considered under such headings as thermotherapy (fever therapy and cryotherapy), electrotherapy, light therapy, hydrotherapy, balneotherapy and climatotherapy, massage, exercises, posture and related topics. Of general interest are the sections dealing with application of physical agents for the treatment of cardiovascular conditions and diseases of the respiratory and gastrointestinal tracts, as well as the sections on arthritis and traumatic lesions. Of particular interest to specialists in other fields are the sections on orthopedic conditions and sections on neurology, pediatrics, gynecology, urology, proctology, dermatology and ophthalmology. The text is replete with information which would be valuable to the younger physician who is searching for a problem in clinical or experimental research. It presents a well rounded and broad picture of the recent developments in physical therapy. It is a work which any practitioner could read with considerable advantage.

**Cunningham's Manual of Practical Anatomy.** Revised and edited by J. C. Brash, Professor of Anatomy in the University of Edinburgh, Edinburgh, and E. B. Jamieson, Lecturer on Anatomy in the University of Edinburgh. Volume I: General Introduction, Upper Limb, Lower Limb. Volume II: Thorax and Abdomen. Volume III: Head and Neck; Brain. Tenth edition. Fabrikoid. Price, \$4.25 per volume. Pp. 411, with 194 illustrations; 500, with 238 illustrations; 535, with 236 illustrations. New York, Toronto & London: Oxford University Press, 1940.

It seems fitting that the fiftieth year of the life of this book should be marked by a new edition. Several earlier editions required two impressions, one required three. It is not only a guide to dissection but also a textbook of regional anatomy. In crowded dissecting rooms, where all workers must follow one plan so as not to get in one another's way, it is excellent: in conditions of less crowding and hurry it has one defect—it teaches the student to "verify" some one else's observation instead of making his own. That is not the best training for a future practitioner. The ninth and tenth editions have been prepared by Professors Brash and Jamieson of the University of Edinburgh. In them the directions for dissection are slightly altered. The text is improved and slightly abbreviated. Relatively more attention is given to surface anatomy, lymph drainage, radiography and clinical application. The nomenclature recommended by English anatomists is used, but the BNA names are given in a comparative list in the introduction. Measurements are English: inches replace centimeters, and weights are not stated. It has been the most widely used and the most popular dissecting manual in the language. Most English speaking physicians are well acquainted with it.

**Die biogenen Amine und ihre Bedeutung für die Physiologie und Pathologie des pflanzlichen und tierischen Stoffwechsels.** Von M. Guggenheim, Dr. phil. et med. h. c. Third edition. Cloth. Price, \$11.25; 48 Swiss francs. Pp. 564. New York: Nordeman Publishing Co., Inc.; Basel: S. Karger, 1940.

The second edition of this book appeared in 1924; the present edition has been completely rewritten to incorporate the major developments represented by the large amount of data accumulated in the intervening sixteen years. George Barger (The Simpler Natural Bases, New York, Longmans, Green & Co., 1914) first recognized the desirability of assembling in systematic form the data on various chemical groups which are related in biologic importance and methodology. Guggenheim (who dedicates his work to Barger) has devoted his efforts to bring together such data for the naturally occurring amines and related synthetic substances. The point of view throughout is that of the organic chemist who appreciates the pharmacologic and biologic importance of his chemicals. A short section on the general properties and methods of study of these amines is fol-



lowed by concise but rather exhaustive discussions of the amines arranged in sections according to their chemical classification: alkyl amines, betaines, diaminocarboxy amines and the like. The ordinary amino acids are not treated as a group but are taken up in the sections where they naturally belong in systematic organic chemistry. The largest proportional space is given to the substances of greatest medical importance, such as choline, creatine, histamine, epinephrine and related compounds. In general, the order of discussion is discovery, occurrence, synthesis, isolation and analysis, biochemical and pharmacologic properties and relations. There are four thousand, one hundred and fourteen cited references, so it is hardly surprising that details of biologic experiments and evidence are not given. There are no illustrations, but atomic and structural formulas are abundant. The book is an indispensable reference work for the organic chemist working with the simpler amines of biologic importance. The absence of an author's index and the brevity of the subject index are regrettable. The investigator whose organic chemistry is wanting may have difficulty in quickly finding the information he desires.

**The Art of Surgery: A Text-Book for Students and Practitioners.** By H. S. Souttar, D.M., M.Ch., F.R.C.S., Surgeon, London Hospital. In Two Volumes. Fourth edition. Fabrikold. Price, 25s. per set. Pp. 402; 403-779, with illustrations. London: William Heinemann, Ltd., 1940.

The British have developed a number of small surgical compends, some of which are deservedly popular. The present work represents such an effort. It is directly aimed at the teaching of surgery to the British student and probably has less value for the American. The art of surgery can surely be advanced by correlation of such reading with experience. The matter is contained in two small handy volumes, which must be convenient to war harassed students. The index, however, should appear in both volumes instead of only in the second. The books contain brief, but lucid and accurate, pictures of usually common surgical conditions and present clear clinical descriptions of many surgical problems. They are aptly illustrated by small sketches. There is no question that in this effort the author has managed to fulfil his intentions. He has a warm style of writing, which is different from the crisp discussion found in the usual American textbooks. Some of the scientific accuracy which we have come to expect is lacking. Hardly any mention is made of the newer knowledge which has brought such great strides in surgical progress. The various vitamins, chemotherapy, continuous intestinal nasal suction, fluid balance and electrolyte replacement receive almost no attention. Surely these are of vital import to the artful surgeon! Unfortunately, the various revisions have not been too thorough. On page 534 the author states that gastroenterostomy was introduced in Billroth's clinic forty-five years ago. This dates the books as ten or fifteen years behind the times, a concept fully supported by the failure to include the recent highly profitable advances in surgery.

**Medical Genetics and Eugenics.** By Charles B. Davenport, B.S., A.B., A.M., Clyde E. Keeler, B.S., M.A., M.S., Maude Slye, A.B., Sc.D., Director of the Cancer Laboratory, Otho S. A. Sprague Memorial Foundation, University of Chicago, Chicago, and Madge Thurlow Macklin, A.B., M.D., LL.D., Associate Professor of Anatomy, Western Ontario Medical School, London, Ontario, Canada. Cloth. Price, \$1. Pp. 141, with 51 illustrations. Philadelphia: Woman's Medical College of Pennsylvania, 1940.

If the reader interprets the title of this book literally he is sure to be disappointed, for this is not a compendium or a comprehensive treatise. It is merely a rather elementary series of six lectures on certain aspects of general human genetics, with emphasis on the medical and eugenic phases of the subject. The lectures, three by the veteran human geneticist C. B. Davenport and one each by the other authors, were delivered at the Woman's Medical College of Pennsylvania in March 1940 in connection with the nineteenth anniversary of the founding of the college. Dr. Davenport presents in interesting form the well known standard data on human variability and mate selection, on some social applications of eugenics, and on heredity in relation to medicine. Dr. Keeler, in a short but interesting chapter, discusses the value of animal experiments to the understanding of human genetics. Dr. Slye reviews her own work

in a chapter on cancer and heredity and draws certain conclusions from her work with mice as to the control of cancer in human beings. Dr. Madge Macklin, in her chapter on the value of medical genetics to the clinician, urges that medical genetics be taught in medical schools. Case studies are presented in which the value of knowledge about hereditary diseases is demonstrated as part of the equipment of the well rounded clinician.

**Shoes and Feet: A Text Book for Students and Practitioners. A Practical Consideration of Fifty Affections of the Foot Found in Chiropodical Practice: Their Relationship to Shoes, and Their Elemental Treatment.** By Frank J. Carleton, D.S.C., Professor of Mechanical Orthopedics and Lecturer in Shoe Therapy, Temple University School of Chiropody, Philadelphia. Foreword by R. Ray Willoughby, B.S., M.D., Dean, School of Chiropody, Temple University. Cloth. Price, \$5. Pp. 357, with 156 illustrations. West Chester, Pa.: Shoes and Feet, the Publishers, 1940.

The author presents, for students and practitioners of chiropody, a discussion of fifty conditions of the foot which are found in the routine practice of chiropody. He discusses the relationship of these to shoes and outlines their treatment. The author is evidently well qualified to discuss the subjects contained in the book. He graduated from Temple University in 1922, has had about eighteen years of clinical and private practice and has been performing clinical service on the staff of his alma mater. He has made special studies and has written considerably on the subject. The causes and treatment of local irritations are outlined, the foot being viewed in its reaction to pressure. Conditions pertinent to the chiropodist's practice are reviewed for the practical application of mechanical alleviation. The book is intended primarily for students. The outline of the history of footwear is well worthy of reading, and illustrations on the evolution of footwear are interesting. He discusses the construction of the modern shoe and goes into detail with regard to shoe manufacture, the basic types of shoes and the measurements and fit of foot gear. There is also a section on pads and strapping for the common disorders of the foot.

**Doctors and Doctors, Wise and Otherwise: On the Firing Line Fifty Years.** By Dr. Charles McDannel Rosser. With Introductory foreword by Dr. Holman Taylor. Cloth. Price, \$3.50. Pp. 388, with illustrations. Dallas: Mathis, Van Nort & Company, 1941.

Those who know Dr. Charles M. Rosser will be glad to have in book form a reflection of his forceful character, his eloquence and his humor. His contribution to the development of medicine in the Southwest is widely recognized. He gives us pictures of the country doctors of the old school and takes us then to the University of Louisville Medical Department, where he acquired his own education. He tells of his career, which included almost every phase of medical practice, as well as the life of the physician as a teacher and a citizen. What his account may lack in literary skill, it gains in forthrightness. In his career he met most of the great and near great in medical practice. He served his time in the courts and in political relationships; he aided in the extension of medical education to the public and he advanced scientific medical legislation. His concluding chapters explain the attitudes of organized medicine in relationship to the maintenance of standards and of ethics. The book is one which might well be placed in the hands of every young medical student as an inspiration.

**Wolf Child and Human Child: Being a Narrative Interpretation of the Life History of Kamala, the Wolf Girl, Based on the Diary Account of a Child Who Was Reared by a Wolf and Who Then Lived for Nine Years in the Orphanage of Mladnapore, in the Province of Bengal, India.** By Arnold Gesell, M.D. Cloth. Price, \$2. Pp. 107, with 10 illustrations. New York & London: Harper & Brothers, 1941.

Many years ago a missionary in India found a child, aged approximately 8 years, living in a wolf's den. He brought her to an orphanage, where she remained until her death nine years later. At first she reacted to her environment as would any wild animal, but apparently suitable care resulted in adapting her to human ways, although she never quite fully reached her normal human age. The book, which is illustrated with photographs, quotations and comments by Dr. Gesell, is a striking document, a fascinating contribution to ethnology.



## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### TREATMENT OF SCABIES

**To the Editor:**—An increasing number of cases of scabies has been experienced for some time in the institution with which I am associated. The physical plant is divided into twelve cottages accommodating about 100 patients each. Cases of scabies have been found in five or six cottages, three of which are thoroughly infested. Persons from other cottages have been working in these cottages having the infestation. Potassium sulfide ointment has been used, and some patients have been cured only to become reinfested soon. Who has had experience in treating a large group in an institution? Please discuss length of treatment (twenty-four hours or three days), agent used and means of treatment. Is it necessary to clean wooden floors on which the patients have been playing and, if so, what method has been found most satisfactory?

Bruce L. Titus, M.D., Salem, Ore.

**ANSWER:**—The principles of treatment of scabies are the same whether few or many persons are infected, but the difficulties mount with numbers. Only two things are necessary to cure a group of patients with scabies: cure of the individual patient and prevention of reinfection.

The difficulty in this problem has evidently been to accomplish the second object. If persons from other cottages have been allowed to work in the infested cottages, it is entirely possible that this has been the loophole.

No remedy effects a cure in the same length of time in all patients. Some have tougher skins and the remedy does not reach the organism so quickly, or perhaps some are more attractive to the itch mite, as has been demonstrated for the louse; but the more likely explanation is that some are not so thorough in applying the remedy. Potassium sulfide ointment will clear up most cases in twenty-four hours. A 10 per cent sulfur ointment will clear up most cases in four days; but there are exceptions. Sherwell (Remarks on the Treatment of Scabies, *J. Cutan. & Genito-Urin. Dis.* 17:494, 1899) advocated the use of washed sulfur alone for the treatment of scabies, the simplest of all methods; but he insisted on a full week's treatment and warned that some cases require nine days. He prefers it to the ointment method because it is cheap, easy to manage and not uncomfortable, avoiding the messy and evil smelling ointments. After the initial bath, hot water and toilet soap for children and thin skinned adults, sand soap (as sapolio) for thick skinned adults, the whole body is lightly rubbed with washed sulfur. A half teaspoon is enough for 1 person. The same amount is placed between the sheets of his bed, and the lower sheet is lightly shaken to disseminate it. This procedure should be repeated every second or third night. Baths and change of clothing may be taken as desired. Sherwell has never seen dermatitis from this procedure even in children, nor has it failed to cure. The physician must inspect the patient carefully after the final bath to make certain that all signs of activity of the itch mite have been eradicated.

The ordinary sulfur ointment treatment, 10 to 15 per cent for adults, 3 to 5 per cent for children, takes four days ordinarily. No bath or change of underwear is allowed during the treatment.

Those patients who have been pronounced cured must be strictly segregated and no contact allowed with any one who has not been examined and pronounced free from scabies. Certain persons tolerate the itch mite and show slight signs of its presence—even some who do not complain of itching—though this is rare. Attendants should be examined at intervals, and those waiting on the infected should not care for the cured. Bechet (Scabies: A Small Institutional Epidemic, with Interesting and Unusual Features, *Arch. Dermat. & Syph.* 16:51 [July] 1927) emphasizes the ease and rapidity with which the disease is spread.

Not only must the remedy be applied thoroughly to every spot on the body below the collar, but the clean-up of the clothing must be thorough, no single article being missed that has been worn next the skin of an infected person. The mites are not supposed to survive on the floor, but it will do no harm to sprinkle it with sulfur powder. This should be swept up before the cottage is filled with cured patients.

After the clean-up, measures to prevent contact with still infected persons must be maintained. The treated patients must be watched for recurrences, which occur sometimes after the

most careful inspection and call for a repetition of treatment; but the physician must carefully differentiate the cases of secondary dermatitis due to sulfur or to scratching. These must not be subjected to further treatment with sulfur, which commonly happens in such epidemics, but must receive soothing treatment, such as calamine liniment:

	Gm. or Cc.
Calamine powder	
Zinc oxide.....	of each 8.0
Olive oil	
Solution of calcium hydroxide.....	of each 60.0
Mix and label:	Dab on the affected part three times a day or oftener.

Continued itching is no proof that the treatment has failed, for the skin sometimes acquires the "habit" of itching, which persists after the original cause has ceased to operate.

Knowles (Scabies in Military and Civil Life, *THE JOURNAL*, Nov. 10, 1918, p. 1657) writes of his experience in the World War. Among 2,000 cases of skin disease there were 500 of scabies. He used 12 per cent precipitated sulfur in petrolatum. After the initial warm bath the soldier had to anoint himself under the eye of an officer, who saw that the job was done thoroughly. Each day for the next three days this was repeated and then, after another warm bath, the whole body was minutely inspected by an expert and if any signs of activity were found another course of four days was ordered. The treatment took place in a tent devoted to that purpose alone, all clothes were carefully disinfected and a separate bath was used by the infected men. Knowles remarks that the soldier's hands were involved less than he had been used to seeing in civilians but the penis was more markedly affected. The complications of scabies, furuncles, impetigo, folliculitis and ulcers occurred oftener in the military patient than in the one in civil life.

Despite the skepticism of Niles (Albuminuria in Association with Scabies, *Arch. Dermat. & Syph.* 38:19 [July] 1938) it will do no harm to examine the urine of children with scabies. Severe nephritis has been recorded, though this, as Niles suspects, may have been only coincidental.

### POSSIBLE RESPIRATORY IRRITANT FROM COTTON DUST OR COTTON DYES

**To the Editor:**—What irritating substance or dye might be present in khaki-colored cotton now being made up for the government into coveralls and such garments? It is reported that the girls and cutters who handle this material suffer sore throats and an irritation of the nose. My patient has had a severe and persistent epistaxis.

Howard Kenneth Scatliff, M.D., Chicago.

**ANSWER:**—In dyeing military fabrics of a coarser nature, such as tent material and tarpaulins, in tan, brown, khaki or olive drab colors, mineral pigments ordinarily are utilized, embracing the salts of chromium and iron. For garment fabrics in these colors, sulfur brown dyes are used almost exclusively, of which there are more than seventy varieties, representing many chemical variations. Catechu, which is derived from acacia catechu, an Indian wood, may be employed. Further, redyeing by a variety of nonsulfur brown dyes to provide special shades or to overcome faulty dyeing with sulfur brown dyes is well known. It is possible that the minor irritation mentioned in the query may not be due to any cause at work, but, assuming the contrary, a number of theoretical opportunities for damage to the respiratory tract may be mentioned:

Ordinarily irritation from any dye is most commonly manifest as a dermatitis. The absence of dermatitis tends to but does not necessarily exclude dyes as the source of respiratory irritation. Failure to use sufficient sodium sulfide along with sulfur dyes may result in undissolved or reprecipitated sulfur brown, which may yield dye dust in the course of the fabrication of articles. Some sulfur brown dye dust may be irritating. On occasion, chromates may be used in connection with sulfur brown dyes, and, if a chromate dust is present, irritation of the nasal mucous membrane is a possibility. In case catechu is the dyestuff, allergens theoretically may exist.

It may be noted that cotton dust itself may be injurious to the respiratory tract, the irritation becoming chiefly manifest by asthma and chronic bronchitis. In England, compensation is provided for byssinosis, a dusty lung disease from cotton dust. Such compensation is limited to male workers in specified cotton mill operations, when the exposure has been for periods of twenty years or more. The limitation of compensation to men is not due to any nonsusceptibility of women but instead to the fact that only men are employed in the highly dusty operations involved. Occupational diseases from cotton dusts are described by Prausnitz (Investigations on Respiratory Dust Disease in Operatives in the Cotton Industry, London, His Majesty's Stationery Office, 1936). Compensation for byssinosis is described

in Report of the Departmental Committee on Compensation for Card Room Workers, London, His Majesty's Stationery Office, 1939, abstracted in the *Journal of Industrial Hygiene and Toxicology* 21:145, 1939, and mentioned in THE JOURNAL, Jan. 11, 1941, page 153. A full description of sulfur brown dyes may be found in a series of articles by A. E. Carr in the *Textile Colorist* beginning in 61:28, 1939. The dyeing of military fabrics is described by J. T. Gibbons in the *Textile World* 90:77 (Nov.) 1940.

The irritations mentioned in the query, if in fact of occupational source, are probably associated with cotton dust. Histamine, if present in the cotton, is of possible significance.

#### DERMATITIS FROM BUTANE OR BUTANE GASOLINE

To the Editor:—What is the toxicity of butane gas on the human body, both internally and externally? If possible, I should like to have the chemical analysis of this gas, with the name of each ingredient and the quantity of each, say, in 1 pint (475 cc.) of gas, or some such quantity. A person had a small quantity of this gas sprayed on his naked arm and hand. A severe irritation of the skin has developed, not only on the particular place on which the gas was sprayed but all over his body, even to the top of his head. He is positive that this gas caused the trouble, since the irritation developed within about twenty-four hours after it was sprayed on him. He has never had any cutaneous trouble of any kind before. In fact, he has always been perfectly healthy in every respect.

W. H. Peacock, M.D., Eastman, Ga.

ANSWER.—The query is not quite clear as to whether butane,  $C_4H_{10}$ , is meant or whether the so-called butane gasoline is meant.

Butane is a colorless, odorless gas, boiling at about 0 C., and is sold in special cylinders containing 12 to 114 pounds (5.4 to 51.7 Kg.). It is manufactured from refinery gases or obtained from natural gas in the process of making natural gasoline. As sold in the cylinders, it consists of 98 per cent normal butane, and the remaining 2 per cent is made up of propane, isobutane and some pentane. The standard specifications state that there shall not be more than 15 grains (1 Gm.) of organic sulfur in 100 cubic feet of the gas. The odor which may be present in commercial butane is due to traces of mercaptans. Butane is used as an enricher of illuminating gas, as a solvent with a low boiling point and as a refrigerant.

There are no reports of studies available on the direct toxicity of butane, but the petroleum solvents when taken into the body affect the blood and the nervous system. Acute poisoning by the petroleum solvents causes headache, blurred vision, mental confusion, dizziness, nausea and loss of consciousness. The effects of short, acute exposure rapidly wear off when the patient is taken into the open air.

The symptoms of chronic poisoning from long continued exposure to petroleum solvents are not characteristic. They consist of apathy, mental confusion, forgetfulness, tremors, muscular weakness, irritation of the air passages, bloody sputum, hemorrhages of the stomach, anemia, albuminuria and neuritis.

The lower the boiling point of a petroleum solvent, the more likely is a person exposed to it to show such symptoms, because the air is more quickly saturated.

Liquefied butane gas is likely to have a powerful irritating effect on the skin, because of its qualities as a powerful fat solvent as well as the fact that evaporation from the skin will result in freezing of the skin. The eruption would consist of erythema with pustules, vesicles and ulcers.

Butane gasoline is the name sometimes applied to natural gasoline or casing head naphtha. It is a liquid hydrocarbon mixture extracted from natural gas by compression, absorption in oil or adsorption in solids. It differs from straight run gasoline by its higher volatility and lower boiling range. It consists of the lower members of the paraffin series from propane to octane. Analyses of a representative sample of natural gasoline shows that it contains by volume about 20 per cent propanes and butanes, 39 per cent pentanes, 24 per cent hexanes, 12 per cent heptanes and 2 per cent absorption oil. A small proportion of aromatic hydrocarbons, such as benzene and toluene, may be present in some samples.

Natural gasoline, on account of its higher volatility, is more toxic and more irritating to the skin than straight run gasoline.

The patient probably not only suffered a dermatitis from the primary irritating effect of the gasoline but also became sensitized, so that other portions of his body, on which only minute portions of the gasoline may have fallen, became sites of allergic dermatitis.

#### Reference:

Hamilton, Alice: *Industrial Toxicology*, ed. 2, New York, Harper & Brothers, 1934, pp. 181-186.

#### APOMORPHINE AND ALCOHOLISM

To the Editor:—Will you please give particulars on the use of apomorphine in the treatment of alcoholism?

M.D., Illinois.

ANSWER.—Apomorphine is about as depressant as heroin, and hence the depressant action of both drugs, i. e. alcohol plus apomorphine, becomes additive and has been known to cause death through respiratory failure. It is much safer to use paraldehyde. Voegtlin (*The Treatment of Alcoholism by Establishing a Conditioned Reflex*, *Am. J. M. Sc.* 199:802 [June] 1940) has occasionally used apomorphine in order to cause nausea, when the other nauseating drugs used for the purpose of conditioning the person with habitual alcoholism against alcoholic drinks have failed. He advises caution in the use of apomorphine, since many patients treated with it suffer alarming syncope coupled with bradycardia at the onset of nausea.

#### BIFOCAL GLASSES

To the Editor:—The answer to the query on bifocal glasses (*The Journal*, March 15, p. 1186) should be supplemented. The occupation of the patient should always be considered when prescribing bifocal lenses. In many cases the usual 16 mm. segment will not be satisfactory. Many barbers require a large lower segment and a small upper portion. The same is true of mechanics. Sometimes mechanics get results by temporarily sliding their glasses down on the nose, not for the purpose of securing greater magnification, but to get the "add" out of the way so that they may look through the upper portion. The type of bifocal ordered depends on several factors, such as the financial status of the patient, the difference in strengths of the upper and lower portions of the lenses, the size of the segments, the difference in the refractions of the two eyes, and the contour of the face. The prescribing of bifocals is not always an easy matter, even after the correct refraction and amount of presbyopia have been determined. Then there are bifocals for myopes! *Modern Ophthalmic Lenses and Optical Glass*, by Theodore E. Obrig, is the best single volume on the subject. Good information can be obtained from a book on shop work published by Professional Press, Chicago. Bughee's Bifocals, though old, is an excellent treatise. *Essentials of Modern Lens Theory*, soon to be put out by the Continental Lens Company, will no doubt be a good work on the subject. All the larger wholesale optical companies send out literature on bifocals that can be studied by ophthalmologists to advantage. A wise eye physician consults a good optician frequently with regard to these problems.

J. J. Horton, M.D., New Orleans.

To the Editor:—There is a great deal of interest among presbyopes in general in bifocals and at times trifocal glasses. Frequently patients are dissatisfied with the lenses they receive and they would be even more dissatisfied if they were aware that, often, better combinations could be secured for them. Few general doctors and not all oculists know the last word in regard to this matter. For example, the surgeon often needs and can easily obtain a special segment. A satisfactory type is one with a large central "reading" section entirely surrounded with a distant segment so that he can see the operative field and can look to all sides for instruments and to note what is going on in the room. There are numerous modifications of this type of lens. A special glass is made for the artist and sculptor so that he can see his model, palette and canvas. The hunter and marksman often needs a segment near the bridge of the nose, and this can be obtained. The shoe clerk can obtain a lens so that he can read from the boxes above his head and at the same time can see patrons who enter the store. A large group need bifocal glasses focused beyond the usual reading distance, for example, the aviator, the carpenter, the laundress, the musician and the railroad engineer, to mention only a few. In his book "Modern Ophthalmic Lenses and Optical Glass" (Philadelphia, the Chilton Company Printing Division, 1935, pp. 261-271 inclusive) Theodore E. Obrig gives an excellent discussion of this subject with various illustrations. Any one interested or not entirely satisfied with the results he is receiving from bifocal or even trifocal glasses would be well repaid to read this article. There are perhaps other similar articles, but they are difficult to locate.

William B. Hubbard, M.D., Flint, Mich.

To the Editor:—In *The Journal*, March 15, page 1186, there appears a query concerning types of bifocals which is not as completely answered as it might be. The answer given deals almost entirely with the refraction of presbyopic patients, while the query concerns types of bifocals for people pursuing different kinds of work. Excellent references on this subject are: Pascal, Joseph I.: Bifocal Lenses, *Arch. Ophthalm.* 24: 553 (Sept.) 1940. Crisp, W. H.: The Bifocal Age, *Am. J. Ophthalm.* 23: 334 (March) 1940.

Olsho, Sidney L.: Vertical Prism Values in Commonly Used Bifocal Lenses, *Arch. Ophthalm.* 20: 95 (July) 1938.

Help in choosing the type of bifocal for ordinary use may be had from the Bifocal Lens Prescription Analysis Chart published by Bausch and Lomb. The monocentric bifocals, discussed by Dr. Pascal in the reference mentioned, are made by the Uhlemann Optical Company of Chicago, who also will balance the prismatic effect in cases of anisometropia so that the prescribing physician does not have to make the difficult calculations. This company will also grind in the reading segment in any position desired by the prescribing physician. Carpenters, grocers, druggists and others who must see things at arm's length above their heads as well as in the usual reading areas are made comfortable by having ground into their lenses two segments for near work—one in the usual position and one above, leaving the middle for distant vision. Barbers and near workers are frequently helped by having the center of the lens ground for near work, leaving the periphery with the distance correction. Bookkeepers are helped by trifocals with an intermediate segment between the reading segment and the distance correction. The middle segment brings into focus material that may be scattered around a desk at arm's length.

Milo Fritz, M.D., Ketchikan, Alaska.





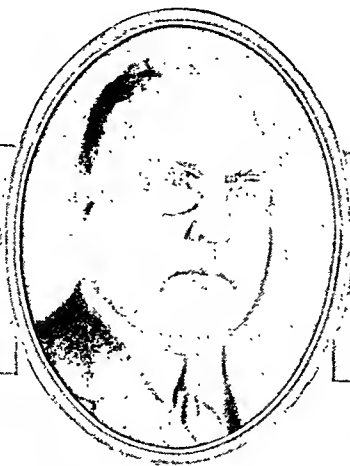
*Frank H. Lahey*

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# The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 116, No. 22

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CHICAGO, ILLINOIS

MAY 31, 1941

## THE DIAGNOSIS OF HYPOTHYROIDISM IN CHILDHOOD

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When severe thyroid deficiency has existed over a considerable span of time during the early years of growth, it gives rise to the classic clinical pictures described as cretinism or as juvenile hypothyroidism, which are readily recognized. Many cretins, however, when seen in the first year or two of life, are less grotesquely abnormal, and on superficial inspection might be mistaken for fairly normal infants considerably younger than their actual age. In studying dwarfs of an older age, one finds almost innumerable variations and gradations from the broad, stocky build of the typical person with hypothyroidism to the slender, wiry, small-featured dwarf who presents no suggestion of thyroid deficiency.

Great differences of opinion have arisen as to what constitutes the signs of hypothyroidism in cases not presenting the frank, typical picture. In recent years there have been a lack of critical analysis and an excess of enthusiasm, so that the diagnosis of hypothyroidism has been made often on the finding of some one suggestive sign. If a child's eyes are widely spaced or his nose is flat or if he is mentally retarded or physically stunted, he may be diagnosed a cretin. In fact, almost any infant who is retarded in development or who is peculiar or ugly runs the chance of being branded as having hypothyroidism. Since most physicians are aware that epiphyseal ossification is delayed in hypothyroidism, roentgenograms of the bones are usually made. If retardation of osseous development is found, the physician considers that the diagnosis of hypothyroidism is proved. Dryness and coarseness of the skin and hair or a dull, phlegmatic disposition likewise may lead to uncritical diagnoses. The numerous variations in type among dwarfs give the endocrinologist opportunities for wide flights of fancy which alight on such diagnoses as thyropituitary, pituitarothyroid and thyrohypogonadal deficiencies, although there is often no real proof of either thyroid or pituitary deficiency.

The existence of "borderline" forms of hypothyroidism or of mixed endocrine disturbances should not be denied, nor should the therapeutic trial of thyroid be discouraged in doubtful cases. However, the limitations of our present knowledge should be frankly recognized and the need for diagnostic humility emphasized. It

seems worth while, therefore, to review and to attempt to evaluate the physical signs resulting from thyroid deficiency in childhood and to discuss some of the recent studies of the functional or biochemical changes.

### CLASSIFICATION OF PHYSICAL SIGNS

In adults, many of the familiar physical signs of hypothyroidism depend on a lowered rate of metabolism and alterations in the circulation. In addition, abnormalities in chemical processes of the body are responsible for some of the characteristic changes in subcutaneous tissues, skin, hair and muscle to which the term myxedema has been applied. In childhood, thyroid deficiency gives rise to additional changes due to its influence on growth and development.

In table 1 are listed the most important signs which result from hypothyroidism during the period of growth. These signs have been divided into anatomic alterations in bodily structure and functional or physiologic alterations. The structural changes which are the most characteristic and the most constant are those caused by defective growth and development of the skeleton. These are stunted growth, infantile skeletal proportions, infantile naso-orbital configuration, retarded skeletal development, delayed and defective development of the teeth and epiphyseal dysgenesis. The changes in other structures of the body are less characteristic and are encountered much less constantly. Frequently the hair is entirely normal and there is little, if any, change in the skin. Thickening of subcutaneous tissues and soft parts such as the lips and tongue may be suggestive of the diagnosis when found; but such changes may not be advanced, and true myxedema is rarely as extreme as in the adult.

### SKELETAL CHANGES

The skeletal changes must be considered in some detail.

*Stunted Growth.*—The rate of growth is invariably slowed in hypothyroidism. In a young cretin, who may be only 1 or 2 inches (2.5 or 5 cm.) below the average height, the dwarfing may not impress the observer. However, if a cretin remains untreated he lags more and more below the normal standards until stunting becomes apparent. During the juvenile period extreme degrees of hypothyroid dwarfism are encountered. On the other hand, if thyroid deficiency does not occur until later childhood—for example the tenth or twelfth year—the patient will have attained such a height before the cessation of growth that he cannot be classified as a dwarf.

Hypothyroidism is one of the most important causes of dwarfism. In the past five years we have studied 64 dwarfs in whom disease of bone and cardiac, renal, intestinal, hepatic and metabolic disorders could be excluded as etiologic factors. Among these, 16 patients (25 per cent) definitely had hypothyroidism. In the remainder, the cause of dwarfism could not be deter-

This work was supported by grants from the John and Mary R. Markle Foundation and from the Commonwealth Fund.

From the Department of Pediatrics, the Johns Hopkins University School of Medicine and the Harriet Lane Home, Johns Hopkins Hospital.

mined. They were presumed to have either pituitary insufficiency or "primordial dwarfism." In all but 1 of the 16 patients with hypothyroidism therapy with thyroid caused a rapid acceleration of growth, whereas similar doses of thyroid had little if any effect on the other types of dwarfism, as shown in figure 1. In the 1 patient who presented characteristic clinical and biochemical evidences of hypothyroidism but who showed no acceleration of growth on treatment with thyroid there was probably some other endocrine deficiency in addition to hypothyroidism. This case is discussed further at the end of the paper.

**Skeletal Proportions.**—The ratio of the upper and lower skeletal segments is determined as follows: The standing height is measured. The lower segment is measured from the top of the symphysis pubis to the floor. The length of the upper segment is found by subtracting the lower segment from the total height. According to the tables of Engelbach<sup>1</sup> the ratio of the upper to the lower segment is about 1.7 to 1.0 at birth. The lower segment, however, normally grows more rapidly than the upper, so that at the age of 5 years the ratio is 1.2 to 1.0 and at 10 or 11 years 1 to 1. The various opinions expressed by different authors concerning the skeletal proportions of children with hypothyroidism have been discussed by de Quervain and Wegelin.<sup>2</sup> It has been our experience that as the child with hypothyroidism grows older not only is growth retarded but the ratio of the skeletal segments remains that of a younger child, corresponding to the height age instead of the chronologic age.<sup>3</sup> On the other hand, most dwarfs who do not have hypothyroidism attain the skeletal proportions approximately normal for their actual age, although this is not invariably true. This is illustrated in figure 2.

**Naso-Orbital Configuration.**—The characteristic facies so frequently seen in the child with hypothyroidism is due largely to the peculiar naso-orbital configuration. The bridge of the nose is flat and broad, causing the eyes to appear widely spaced, and the nose is short and undeveloped. De Quervain and Wegelin<sup>2</sup> have

TABLE 1.—Classification of Signs

Structural changes	
Skeleton	
Height—stunted	
Skeletal proportions, upper : lower segment—infantile	
Naso-orbital development—infantile	
Osseous development—retarded	
Dental development—retarded and defective	
Epiphyseal dysgenesis—frequently present	
Other structures	
Brain development—retarded	
(Skin—variable)	
(Hair—variable)	
(Subcutaneous tissues—variable)	
Functional changes	
Physical and mental torpor	
Peripheral circulation poor—skin pale, grayish, cool	
Pulse rate × pulse pressure—decreased	
(Sweating—variable)	
Constipation	
Biochemical and metabolic changes	

attributed the abnormality to failure of growth at the spheno-occipital synchondrosis and disproportions in the development of the sphenoid bone. Dye and

Maughan<sup>4</sup> have shown in experimental animals that the growth of endochondral bone is retarded while that of membranous bone is not. It seems to us that the hypothyroid facies is caused, at least partly, by the persistence of infantile characteristics, just as the proportions between the upper and lower skeletal segments

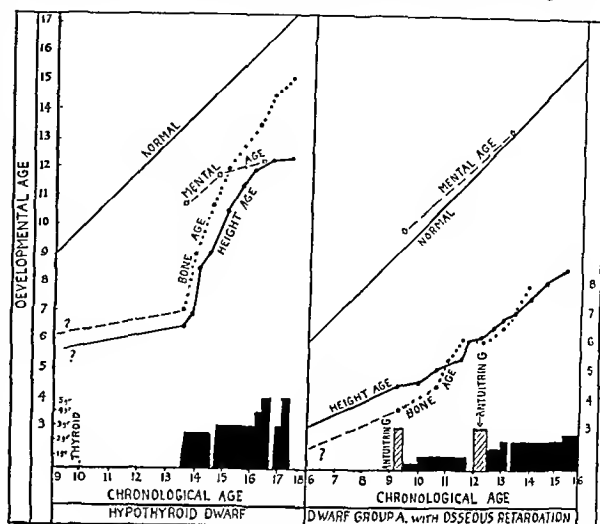


Fig. 1.—Comparison of the effect of thyroid treatment on a dwarf with hypothyroidism and on a dwarf showing a similar degree of osseous retardation but presenting no evidences of thyroid deficiency. Treatment caused a rapid acceleration of the rates of growth and osseous development in the hypothyroid patient but had little effect on the other dwarf.

remain infantile. The normal development of the features, and especially of the nose, is delayed, so that the child of 5 or 6 years with hypothyroidism often shows the naso-orbital conformation of an infant 1 or 2 years old.

**Retardation of Osseous Development.**—It has been known for many years that hypothyroidism always causes delay in the appearance of ossification in the cartilaginous centers. Treatment with thyroid causes an immediate acceleration in the rate of osseous development. We<sup>6</sup> have found that by following the rate of osseous development during treatment one can determine whether an adequate dose of thyroid is being given.

In recent years, some clinicians unfortunately have jumped to the conclusions that the thyroid gland alone controls the ossification of the cartilages and that retardation of osseous development is pathognomonic of hypothyroidism. Diagnoses of so-called borderline hypothyroidism or of mixed thypituitary dwarfism have been based on this sign alone. We are convinced that this practice is fallacious. Endochondral ossification is at times definitely delayed in conditions which are not hypothyroid in origin. Among 50 dwarfs, in whom no evidences of thyroid deficiency were detected by means of any of the studies which we shall describe, 30 (60 per cent) showed delay of two to six years in appearance of the centers of ossification. In many instances the degree of retardation was as great as in patients with hypothyroidism. In these cases thyroid medication caused slight, if any, acceleration in the rate of osseous development, in contrast to the specific, rapid acceleration which occurs in patients with hypothyroidism. This is illustrated in figure 1.

1. Engelbach, William: Endocrine Medicine, Springfield, Ill., Charles C. Thomas, Publisher, 1932.

2. de Quervain, Fritz, and Wegelin, C.: Der endemische Kretinismus, in Aschoff, Ludwig; Elias, Herbert; Eppinger, Hans; Sternberg, Carl, and Wenckebach, K. F.: Pathologie und Klinik in Einzeldarstellungen, Berlin, Julius Springer, 1936, vol. 7.

3. Although the shortening of the lower extremities in hypothyroidism is largely attributable to the persistence of an infantile characteristic, shortening and deformity of the necks of the femurs may also contribute to it.

4. Dye, J. A., and Maughan, G. H.: The Thyroid Gland as a Growth-Promoting and Form-Determining Factor in the Development of the Animal Body, *Am. J. Anat.* 44: 331 (Nov.) 1929.

5. Wilkins, Lawson: The Rates of Growth, Osseous Development and Mental Development in Cretins as a Guide to Thyroid Treatment, *J. Pediat.* 12: 429 (April) 1938; Thyroid Medication During Childhood, *J. A. M. A.* 114: 2382 (June 15) 1940.



**Defective Dental Development.**—This subject cannot be discussed in detail in this paper. The development of the teeth is always retarded, and the delay is usually proportional to that in the endochondral ossification. In addition, the teeth which erupt during the period of thyroid deficiency are defective in structure and undergo early caries.

**Epiphyseal Dysgenesis.**—This is probably the most specific of all the anatomic changes which are found in hypothyroidism. It is due to a disorder of the cartilages of the epiphyses and round bones leading to irregularities in their subsequent ossification. Normally, ossification begins from a single small focus in the center of the cartilage and extends peripherally in an orderly manner. If thyroid deficiency exists during the period in which ossification normally occurs, the appearance of the deposition of calcium is considerably delayed, as we have already pointed out. When calcification finally occurs, it appears as multiple, small, irregular foci scattered over a considerable area of the cartilage. These grow larger and coalesce to form a single irregular center. According to the stage of the process, the roentgenogram may show multiple small centers of ossification or a single center which may appear either stippled, porous, fluffy or fragmented. Various stages in the ossification of the head of the femur in children with hypothyroidism are shown in figure 3. In the head of the femur the condition often cannot be differentiated in the roentgenogram from Perthes' disease. The two conditions, however, are entirely unlike in their pathogenesis. Perthes' disease is a destructive process involving an epiphysis which has previously been normally formed; in hypothyroidism there is an abnormality in the development of the cartilage and its conversion into bone. Although hypothyroid epiphyseal dysgenesis is observed most frequently and is most spectacular in the heads of the femurs and the navicular of the tarsus, it involves all the endochondral centers in which ossification normally

by some workers in a large proportion of patients with endemic cretinism. However, in reviewing serial roentgenograms of the bones of 25 children with hypothyroidism one of us<sup>6</sup> found epiphyseal dysgenesis in all but 2 cases. In these 2 cases roentgenograms had been taken only at long intervals after treatment was begun.

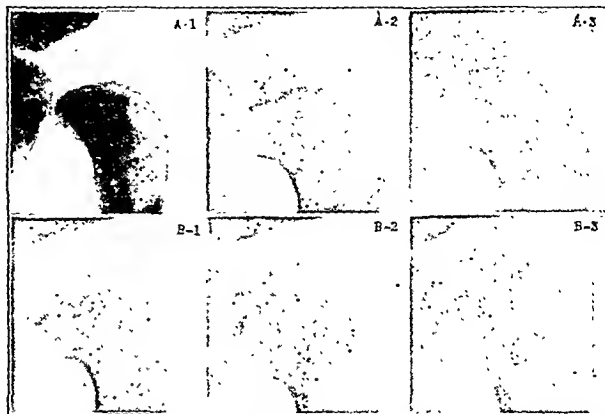


Fig. 3.—Dysgenesis of the femoral epiphysis in cretins under treatment. Different stages in ossification. Case A illustrates the fact that dysgenesis may occur while the patient is under treatment with thyroid. A, cretin, first treated at the age of 6 years: A 1, first appearance of calcification two and one half months after beginning treatment; A 2, five and one half months after beginning treatment; A 3, twenty-two months after beginning treatment. B, cretin, first treated at the age of 8 years and 9 months: B 1, before treatment; B 2, seven and one half months after beginning treatment; B 3, twelve months after beginning treatment.

It was found not only that those centers which were already calcified before treatment with thyroid was begun were affected but also that those centers whose ossification had been delayed developed in the characteristically abnormal manner, even after the institution of therapy.

**Retardation and Defect in Development of the Brain.**—When thyroid deficiency occurs in the early years of life it causes delay in the development of the brain. If the condition remains untreated permanent damage may result, and there may be histologic changes in the brain cells which have been described by Lotmar.<sup>7</sup> If treatment is instituted within the first year or two of life, permanent damage may at times be avoided and normal mental development may take place. If hypothyroidism does not occur until the later years of childhood, there may be no defect in the development of the brain and the intelligence quotient may be entirely normal, although the patient may be mentally sluggish and slow in response.

**Diagnostic Significance of Structural Changes.**—We have discussed so far the anatomic or structural changes brought about by hypothyroidism, especially those of the skeleton, and have pointed out that they are due principally to a retardation or a distortion of normal processes of development which occur during the growth period of early childhood. When all or most of these anatomic changes are combined, the clinical picture is usually unmistakable. However, some of these changes, for instance the dwarfing, the osseous retardation or the facial configuration, may occur in children who do not have hypothyroidism and may lead to mistaken

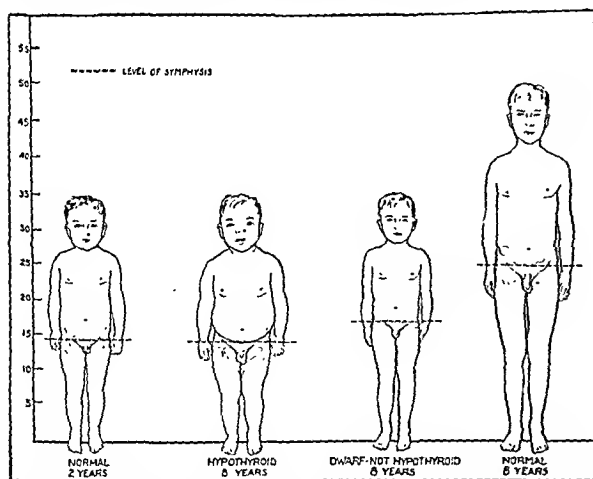


Fig. 2.—Diagram showing that the skeletal proportions of dwarfs with hypothyroidism correspond to the "height age," while those of other dwarfs correspond to the chronologic age.

occurs during the period in which the deficiency exists. It can be found if roentgenograms are taken frequently enough to show the earliest appearance of calcification. From the paucity of American literature on the subject one might suspect that the condition is relatively rare in sporadic cretinism, although it has been encountered

6. Wilkins, Lawson: Epiphyseal Dysgenesis Associated with Hypothyroidism, *Am. J. Dis. Child.* 61: 13 (Jan.) 1941.

7. Lotmar, F.: Histopathologische Befunde in Gehirnen von kongenitalem Myxödem (Thyreoplasie), *Ztschr. f. d. ges. Neurol. u. Psychiat.* 119: 491, 1929; Entwicklungsstörungen in der Kindheit beim endemischen Kretinismus, *ibid.* 136: 412, 1931; Histopathologische Befunde in Gehirnen von endemischen Kretinismus, Thyreoplasie und Kachexia thyreopriva, *ibid.* 146: 1, 1933.

diagnoses. If hypothyroidism exists, one should find not only anatomic changes but also definite physiologic evidences of diminished thyroid function, such as physical and mental sluggishness, circulatory changes and

"borderline" forms of hypothyroidism or of mixed endocrine disturbances must depend on functional rather than structural changes.

#### FUNCTIONAL CHANGES

Mental sluggishness and physical inactivity are shown, to more or less degree, by all patients with hypothyroidism. The torpor and slow mental reactions characteristic of children with hypothyroidism are distinct from retarded or defective development of the brain. Thyroid therapy almost immediately causes the patient to become more alert and responsive; actual improvement in mental capacity occurs only gradually, and certain cerebral defects may be irreparable.

Diminution in the cardiac output and circulatory rate are constantly present. Clinically, however, the measurement of circulatory changes is difficult and unreliable in children. Although the pulse rate is usually decreased and the pulse pressure diminished, the difficulty of establishing true basal conditions and the absence of fixed norms make it impossible to apply the Read formula, which is the product of pulse rate and pulse pressure, to the diagnosis of hypothyroidism in children, as is sometimes done in adults. More reliable evidences of decreased peripheral circulation are a characteristic pale, grayish color of the cheeks and lips and a circulatory mottling of the skin. These are usually seen in children with hypothyroidism and, indeed, they are encountered with such regularity that one should hesitate to make a diagnosis of hypothyroidism in a child with bright, ruddy cheeks and lips. Whenever thyroid therapy is discontinued, the loss of color from the skin is usually the first evidence of a beginning relapse. A yellowish tinge of the skin due to the deposition of carotene is a more specific sign of hypothyroidism but is not found in all cases.

To devise more exact and objective methods of diagnosing thyroid deficiency the clinician has had to turn to laboratory methods. Although the study of the

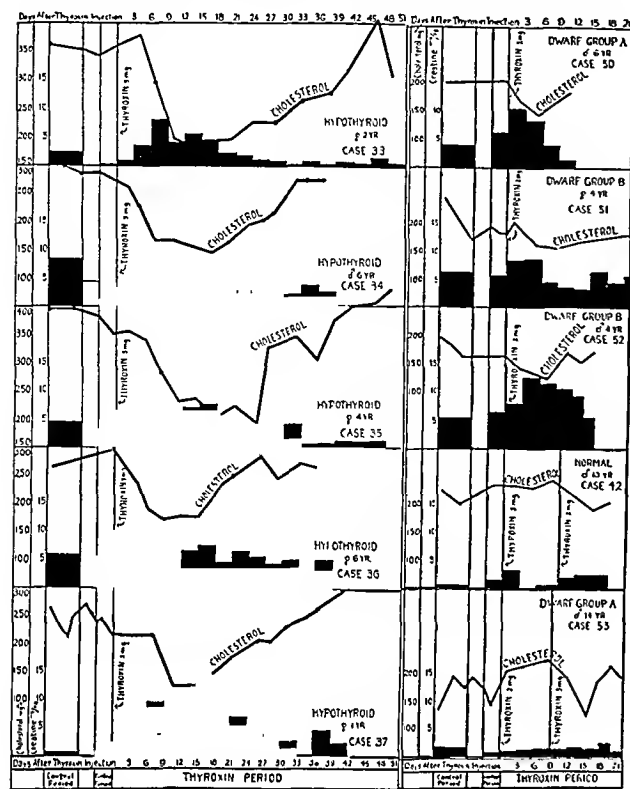


Fig. 4.—Response to a single dose of thyroxine. In the 5 patients with hypothyroidism (on the left side of the chart) there was a great and prolonged decrease in the serum cholesterol. In the 5 control patients presenting no evidences of hypothyroidism (on the right side of the chart) the decrease in the serum cholesterol was slight and transient. Dwarfs of group A showed noticeable retardation of osseous development, those of group B, normal osseous development.

metabolic and chemical abnormalities, which are discussed later.

The question now arises as to whether thyroid deficiency may occur during childhood without causing any of the characteristic structural changes. It is obvious that to cause such changes the deficiency must be present during the years of life in which the important developmental processes occur and that it must exist for a considerable period of time before any deviation from normal development becomes obvious. If hypothyroidism develops in a late period of childhood, for instance between the eighth and the twelfth year, when the more mature characteristics of the skeleton already have been attained, structural abnormalities are usually absent or of mild degree. If the deficiency is of only short duration, the deviation from normal may not be appreciable. In the first year of life the cretin is frequently hard to recognize by his appearance. Similarly, if hypothyroidism develops in a child at 6 years a number of years may elapse before there is sufficient deviation from normal development to suggest the diagnosis. Furthermore, if any thyroid treatment has been given during the important stages of development, all structural abnormalities may be prevented. Finally, it is theoretically possible that a mild degree of hypothyroidism might exist throughout childhood without causing characteristic anatomic changes. Since under the conditions mentioned thyroid deficiency might exist without any structural characteristics, the diagnosis of atypical or

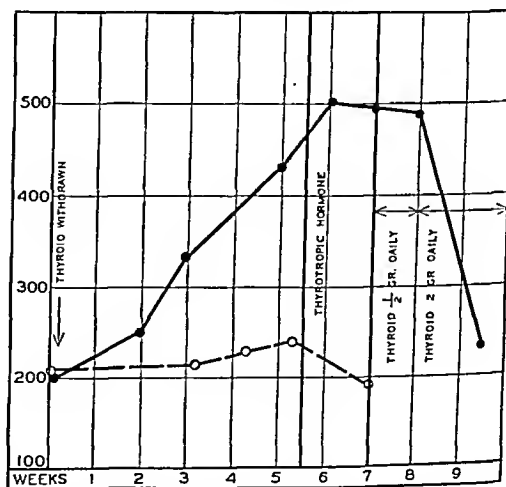


Fig. 5.—Effect of discontinuing thyroid treatment on the serum cholesterol of a child with hypothyroidism compared to a normal child. —●—●— = Serum cholesterol of a child with hypothyroidism, previously treated with 3 grains (0.2 Gm.) of desiccated thyroid daily. —○—○— = Serum cholesterol of a normal child who had received 5 grains (0.3 Gm.) of desiccated thyroid daily for one year previously.

metabolism of iodine might seem to be the most direct and specific approach to the problem, the technical difficulties of measuring the minute amounts of iodine present in the blood make it impractical for most laboratories. The methods of study which are readily avail-

able are the measurement of the basal metabolic rate, the serum cholesterol and the urinary excretion of creatine. We wish to discuss the recent work along these lines.

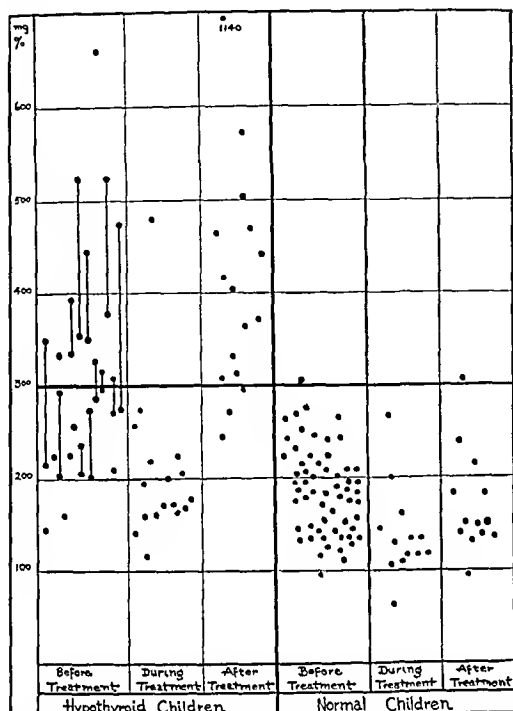


Fig. 6.—Serum cholesterol of children with hypothyroidism and of normal children before treatment, during treatment and after its withdrawal. Before treatment the concentration of cholesterol in children with hypothyroidism is often within the normal range. After treatment with thyroid is discontinued the cholesterol of children with hypothyroidism usually reaches high levels; that of normal children does not.

**Basal Metabolism.**—The measurement of the basal metabolic rate in young children or mentally subnormal children is unreliable, because of the difficulty in obtaining cooperation and establishing basal conditions. In only about one fourth of the children with hypothyroidism we<sup>8</sup> have studied could the basal metabolic rate be determined satisfactorily. In these cases the basal metabolic rates were —25 per cent to —40 per cent when compared to the Boothby-Sandiford surface area standards. When compared to these standards the rates of many obese children who present no evidences of hypothyroidism are just as low. However, when a comparison is made to the Talbot<sup>9</sup> height standards, children with hypothyroidism show definitely low metabolic rates, while obese children who do not have hypothyroidism have normal or even elevated rates. Occasionally we have seen children who have had a low basal metabolic rate even with the height standards and yet have presented no symptoms or signs whatever of thyroid deficiency. We do not believe that it is justifiable to base a diagnosis of hypothyroidism exclusively on the basal metabolic rate. The increasing popularity of the metabolism machine in the physician's office is becoming responsible for a growing number of ill considered diagnoses both in adult medicine and in pediatrics.

8. Wilkins, Lawson; Fleischmann, Walter, and Block, Walter: Studies on Hypothyroidism in Childhood: The Basal Metabolic Rate, Serum Cholesterol and Urinary Creatine Before Treatment, *J. Clin. Endocrinol.* 1:3 (Jan.) 1941.

9. Talbot, F. B.: Basal Metabolism Standards for Children, *Am. J. Dis. Child.* 55: 455 (March) 1938.

**Serum Cholesterol and Creatine Excretion in Untreated Hypothyroid Children.**—The serum cholesterol can be determined accurately and simply by proper chemical methods without the use of a special diet. The determination of the excretion of creatine requires that the patient be given a diet low in creatine and that the urine be collected quantitatively and examined daily over a period of one to two weeks. The cholesterol and creatine of untreated children with hypothyroidism have been discussed by Wilkins, Fleischmann and Block.<sup>8</sup>

The serum cholesterol in the majority of children with hypothyroidism is between 250 and 600 mg. per hundred cubic centimeters, compared to a range of 100 to 300 mg. per hundred cubic centimeters in normal children. In the child with hypothyroidism the concentration of cholesterol from time to time may fluctuate as much as 200 mg. per hundred cubic centimeters, whereas we have not encountered fluctuations greater than 80 mg. per hundred cubic centimeters in normal children. At times we have found the serum cholesterol as low as 150 mg. per hundred cubic centimeters in children with severe hypothyroidism. Since the ranges of cholesterol found in normal patients and those with hypothyroidism overlap, a cholesterol value below 300 or 325 mg. per hundred cubic centimeters does not exclude thyroid deficiency, but a concentration above this is suggestive of this diagnosis, if other causes of hypercholesteremia, such as diabetes, nephrosis or hepatic disease, are not present.

There is a tendency for the excretion of creatine to be low in the child with hypothyroidism, although it may be as high as 4 mg. per kilogram of body weight daily. There are, however, great differences in the excretion of creatine in normal children, varying from 0.5 to 8 mg. per kilogram of body weight daily. It is therefore impossible to differentiate the untreated child

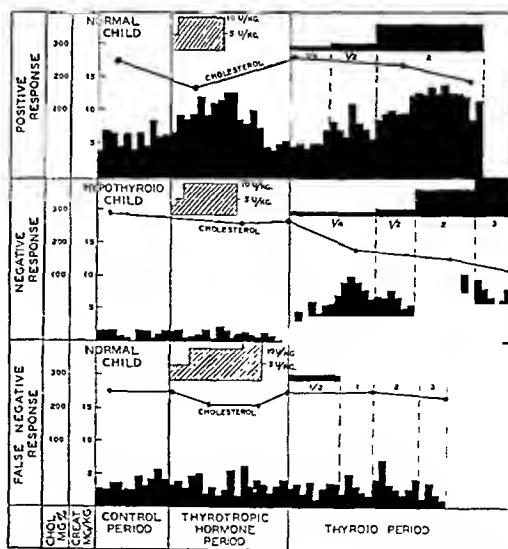


Fig. 7.—Response to thyrotropic hormone and to thyroid. The normal child having the "positive response" showed an increase of the excretion of creatine with thyrotropic hormone and with desiccated thyroid. The child with hypothyroidism having the "negative response" showed no increase of creatinuria with thyrotropic hormone but a definite increase with thyroid. The normal child having the "false negative response" showed no increase of creatinuria after the administration of either thyrotropic hormone or large doses of desiccated thyroid.

with hypothyroidism from the normal child on the basis of the excretion of creatine. Likewise, we have not found that the creatine tolerance test is of diagnostic value.

*Sensitivity to a Standard Dose of Thyroxin Measured by the Effect on Serum Cholesterol and Urinary Creatinine.*—It has been pointed out frequently that a small dose of thyroid or thyroxin has a remarkable effect on a person with thyroid deficiency, while the same dose has slight if any effect on a normal person. Means<sup>10</sup>

TABLE 2.—Effect of Thyrotropic Hormone and of Thyroid on Excretion of Creatine

Type of Response	Increased Creatinuria with Thyrotropic Hormone	Thyroid	Children with Hypothyroidism	Normal Children	Dwarfs without Hypothyroidism	Total
Positive.....	+	+	0	14	6	20
Negative.....	0	+	9	0	0	9
False negative.....	0	0	0	3	3	6
Totals.....			9	17	9	35

and his co-workers have emphasized that it is more important diagnostically to observe the effect on the basal metabolic rate of the administration of thyroid or the withdrawal of thyroid therapy than merely to measure the basal metabolic rate in the untreated patient. Since the determination of the basal metabolic rate is so unsatisfactory in children, Wilkins, Fleischmann and Block<sup>11</sup> decided to measure the serum cholesterol and the excretion of creatine in studying the effect of the administration and withdrawal of thyroid.

At first we attempted to compare the sensitivity of normal children and of those with hypothyroidism by giving small daily doses,  $\frac{1}{4}$  grain (16 mg.) or  $\frac{1}{2}$  grain (32 mg.), of desiccated thyroid by mouth. Great differences between the two groups were found, especially in the effect on the excretion of creatine. Later we found that a more satisfactory differentiation could be made by giving a single intramuscular dose of 2 mg. or 5 mg. of thyroxin. Figure 4 shows the results of these studies. In the child with hypothyroidism a single dose of thyroxin causes a noticeable decrease in the serum cholesterol. The effect lasts for a long period, from thirty to seventy days, usually about forty days, before the cholesterol returns to its previous high level. In the normal child the same dose of thyroxin causes only a slight and transient lowering of the level of cholesterol, usually lasting no longer than ten days. Even when the cholesterol concentration of the normal child and that of the child with hypothyroidism are not far different before injection, as in cases 37 and 42 (fig. 4), the responses to thyroxin differ sharply. The excretion of creatine does not show as great a difference between the two groups of children, because some normal children (case 52) show a decided increase in the excretion of creatine after the injection of thyroxin.

*Effect of the Withdrawal of Thyroid Medication on the Serum Cholesterol.*—In studying the effect of discontinuing thyroid medication we<sup>12</sup> have observed that the serum cholesterol usually rises to high levels, between 300 and 600 mg. per hundred cubic centimeters, within a period of eight to twelve weeks. A similar rise of cholesterol does not occur in a normal child if thyroid is given for a period and then discontinued.

This is illustrated in figure 5, in which are compared the cholesterol values of a normal child and one with hypothyroidism. Each had received large doses of thyroid for a long period. The concentration of cholesterol in each case was approximately 200 mg. per hundred cubic centimeters when thyroid was discontinued. The serum cholesterol of the child with hypothyroidism rose to 500 mg. at the end of six weeks; that of the normal child did not exceed 240 mg. It is of interest that after thyroid medication is discontinued the serum cholesterol in many cases reaches a higher concentration than is observed before treatment is first begun. This is illustrated in figure 6. The rise of cholesterol after the withdrawal of thyroid is of considerable practical diagnostic value. This is particularly true in children with hypothyroidism who previously have been treated elsewhere and who have lost all their stigmas of hypothyroidism. If the previous diagnosis is open to question, thyroid medication can be discontinued and the cholesterol observed over a period of eight to twelve weeks. A definite rise in cholesterol is often found long before characteristic clinical signs have returned.

*Response to Thyrotropic Hormone.*—The thyrotropic hormone of the pituitary gland stimulates the activity of the thyroid gland. By injecting this hormone and observing the effect on the excretion of creatine, the serum cholesterol and the basal metabolic rate, one might presumably determine whether the patient has a thyroid gland capable of functioning effectively. In studying this problem we<sup>13</sup> found that the excretion of creatine was the most sensitive indicator of the effect of medication with thyroid, because in normal children the administration of thyroid usually causes a definite increase in the output of creatine but has little effect on the serum cholesterol. In making the test, the average daily output of creatine was determined over a control period of one to two weeks. Thyrotropic hor-

TABLE 3.—Summary of Biochemical Studies

	Hypothyroidism	No Hypothyroidism
Basal metabolic rate—before treatment		
Surface area standard.....	—19 to —40%	—10 to —28% (obesity)
Height standard.....	—14 to —33%	+40 to —15% (obesity)
Cholesterol—before treatment		
Range for group.....	150-600 mg. per 100 cc.	100-300 mg. per 100 cc.
Spontaneous fluctuations.....	200 mg. per 100 cc.	83 mg. per 100 cc.
Creatine—before treatment.....	0.0-3.8 mg. per Kg. per day	0.6-7.8 mg. per Kg. per day
Sensitivity to 5 mg. of thyroxin		
Cholesterol decrease.....	120-220 mg. per 100 cc.	0-76 mg. per 100 cc.
Average duration of effect....	38 days	9 days
Withdrawal of thyroid treatment—cholesterol increase.....	98-411 mg. per 100 cc.	10-64 mg. per 100 cc.
Effect of thyrotropic hormone on output of creatine.....	Negative	Positive or "false negative"

none,<sup>14</sup> in doses of 5 to 10 units per kilogram of body weight, was injected daily for about ten days, and the daily excretion of creatine was measured. Treatment was then omitted until the excretion of creatine returned to the base level. Finally, the effect of desiccated

10. Means, J. H.: The Thyroid and Its Diseases, Philadelphia, J. B. Lippincott Company, 1937.

11. Wilkins, Lawson; Fleischmann, Walter, and Block, Walter: Studies on Hypothyroidism in Childhood: Sensitivity to Thyroid Medication as Measured by the Serum Cholesterol and the Creatine Excretion, J. Clin. Endocrinol. 1: 14 (Jan.) 1941.

12. Wilkins, Lawson, and Fleischmann, Walter: Studies on Hypothyroidism in Childhood: The Effect of Withdrawal of Thyroid Therapy upon the Serum Cholesterol; Relationship of Cholesterol, Basal Metabolic Rate, Weight and Clinical Symptoms, J. Clin. Endocrinol. 1: 91 (Feb.) 1941.

13. Wilkins, Lawson, and Fleischmann, Walter: Studies on Hypothyroidism in Childhood: The Creatine and Cholesterol Response to Thyrotropic Hormone, J. Clin. Endocrinol. 1: 98 (Feb.) 1941.

14. The "thyrotropic factor" of Ayerst, McKenna and Harrison, containing 50 units per cubic centimeter, was used.

thyroid or of thyroxin was tested. This last step is essential in distinguishing "true negative" from "false negative" responses, as we shall explain later.

The three types of response, "positive," "negative" and "false negative," which were encountered are illustrated in figure 7, which shows studies made on 3 children—a dwarf with hypothyroidism, his normal twin sister and another normal control. In the first normal child the injection of thyrotropic hormone caused a definite increase in the excretion of creatine and a moderate decrease in the serum cholesterol. Desiccated thyroid caused a similar response. In the child with hypothyroidism, thyrotropic hormone had no effect on the creatine or cholesterol, while small doses of desiccated thyroid caused a decided increase in the output of creatine and a decrease in the serum cholesterol. This is a "true negative" response to the hormone, because the increased output of creatine with desiccated thyroid shows that the excretion of creatine is actually responsive to the effect of the thyroid. The other normal child showed the third type of response, which we have termed "false negative." In this case neither thyrotropic hormone nor the usual doses of thyroid had any effect on the excretion of creatine. Such a failure to respond to thyrotropic hormone cannot be interpreted as indicating that the thyroid gland is absent or unresponsive, because even the administration of thyroid caused no increase in the output of creatine.

Nine children with hypothyroidism whom we studied showed negative responses. Normal children and dwarfs presenting no evidences of thyroid deficiency usually gave positive responses, but a few showed the "false negative" response. Table 2 shows the results in 35 cases studied. It should be pointed out that under certain circumstances thyroid deficiency might be present in a patient having a positive response to thyrotropic hormone. This would occur if the gland was present and capable of stimulation but nevertheless was underfunctioning from some cause. We have encountered 1 such case not included in the table but discussed in the next section.

#### SUMMARY OF SPECIAL DIAGNOSTIC STUDIES

In table 3 are summarized the results of the special laboratory studies discussed. Exact criteria for the diagnosis of thyroid deficiency cannot yet be stated. We believe that the work discussed is only a beginning in the search for more specific and objective methods of measuring thyroid function. Among 42 children with hypothyroidism whom we have encountered in the last five years, most have presented characteristic clinical pictures of cretinism or of juvenile hypothyroidism. In such cases the elaborate biochemical studies described have served only to confirm diagnoses which were already fairly clearcut. During the same period we have seen 50 other dwarfs. In a few of these dwarfs of stocky build, the presence of noticeable retardation of osseous development and certain atypical anatomic features have suggested the possibility of the existence of a hypothyroid factor. In most of such cases the biochemical studies have failed to reveal evidences of thyroid deficiency. In other children coming under observation, studies such as we have described have been of value in excluding erroneous diagnoses of hypothyroidism based on the existence of a low basal metabolic rate or of a single anatomic peculiarity. Concerning the existence of mixed pituitary-thyroid deficiency we know little. So far we have studied only 1 patient who presented substantial evidence of a mixed deficiency. She

was a sexually immature girl aged 20 years. Biopsy demonstrated that her thyroid gland was present but atrophic. There were definite clinical and biochemical evidences of hypothyroidism. The injection of thyrotropic hormone apparently caused a biochemical response consisting of a fall in the cholesterol level from 369 to 221 mg. per hundred cubic centimeters. However, intensive thyroid therapy over a period of five years has brought about no sexual maturation and no appreciable acceleration in the rate of growth, in spite of the fact that the epiphysal lines are not closed. We think that this is the only case in which we have demonstrated a definite thyroid deficiency which may be secondary to a pituitary deficiency.

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## POSTMENOPAUSAL OSTEOPOROSIS

### ITS CLINICAL FEATURES

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Our object in this paper is to point out the existence of postmenopausal osteoporosis and to describe its clinical features. Some metabolic data showing the effects of therapy with estrogens and other agents are incorporated in other papers.<sup>1</sup>

It will probably be well to start by explaining and defining the term "osteoporosis." Adult bone is normally subject to two continuous processes—formation and resorption. The mass of bone may be deficient either because resorption is too great (hyperparathyroidism with osteitis fibrosa generalisata) or because formation is too little (osteoporosis or osteomalacia). Formation of bone may be too little, furthermore, either because the osteoblasts do not lay down sufficient osseous matrix or because the matrix, once laid down, is not calcified. The former condition is osteoporosis; the latter, osteomalacia or rickets (fig. 1).

It is thought that stresses and strains are an important stimulus to osteoblastic activity and that the atrophy of disuse is due to a decrease of this stimulus. There is considerable evidence, furthermore, that the osteoblasts manufacture the enzyme phosphatase and that the serum phosphatase level (in the absence of hepatic disease) is an index to osteoblastic activity. An important clinical inference is based on these two suppositions. It may be stated as follows: In the presence of a rarefied skeleton, which is accordingly more subject to stresses and strains than the normal, the serum phosphatase level will be high unless the cause of the rarefaction is primary hypoplasia of the osteoblasts, i. e., osteoporosis. Hence a most important feature of osteoporosis is the absence of a raised phosphatase level.

Since osteoporosis is really not a disease of calcium metabolism, it is not surprising that the serum calcium and phosphorus levels are normal.<sup>2a</sup> The same is not

This work was aided by a grant from the Committee for Research in Problems of Sex of the National Research Council.

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1. Albright, Fuller; Bloomberg, Esther, and Smith, P. H.: Postmenopausal Osteoporosis. *Tr. A. Am. Physicians*, to be published. Albright and Bloomberg.<sup>2</sup>

2a. An exception to this statement occurs when young individuals have a large proportion of their skeleton abruptly immobilized by infantile paralysis or by a cast; under these circumstances one may encounter a hypercalcemia. This will be the subject of a separate communication.



always true of the urinary excretion of calcium and phosphorus, probably for the following reason: Since normally some of the calcium and phosphorus which is set free by the process of resorption of bone is used again for formation of bone, it follows that any curtailment of the latter process would increase the excretion of calcium and phosphorus in the urine. However, once the skeleton has become extremely depleted, the amount of calcium and phosphorus derived from resorption of bone will be small even though the amount of resorption per unit of skeleton remains constant. When this situation has arisen the urinary excretion of calcium and phosphorus will be normal or even low. Hence hypercalciuria and hyperphosphaturia disappear after the skeleton becomes demineralized in osteoporosis, in contradistinction to hyperparathyroidism, in which they persist regardless of the degree of decalcification.

#### REVIEW OF THE LITERATURE

We are by no means the first to suggest a connection between ovarian function and calcium metabolism. Lawrence and Riddle<sup>2</sup> showed that there is more phosphorus in the blood stream of female than of male fowls and that still larger amounts of phosphorus are found in the blood of laying hens than of nonlaying hens. Riddle and Reinhart<sup>3</sup> demonstrated that there is a definite rise in the blood level of calcium in pigeons at the time the eggs are ready to leave the ovary. Hughes, Titus and Smits<sup>4</sup> showed an increase in serum calcium in laying hens. Macowan<sup>5</sup> correlated the degree of rise of the serum calcium level in the hen with the size of the egg. Riddle and Dotti<sup>6</sup> found in normal, hypophysectomized and thyroidectomized pigeons that the giving of follicle-stimulating hormone produces a rise in serum calcium; no similar rise was noted in castrate pigeons. Kyes and Potter<sup>7</sup> noted that the long bones of female pigeons are solid while those of male pigeons are filled with marrow. Gardner and Pfeiffer<sup>8</sup> gave estrogenic material to mice and noted that the marrow cavities were almost completely replaced by compact bone or by coarse bone spicules. Gardner and Pfeiffer<sup>8</sup> showed that the giving of testosterone hinders this effect of estrogen on the skeletons of mice. Pfeiffer and Gardner<sup>9</sup> found that administration of estrogen to pigeons causes hypercalcification of the long bones in both males and females and likewise raises the serum calcium level. Bach<sup>10</sup> administered estrogen to female rats and found that there is an initial fall in the excretion of calcium followed by an increased excretion.

#### ETIOLOGY OF OSTEOPOROSIS

Whereas it is our primary object in this paper to point out that the postmenopausal state is a factor in osteoporosis, it might be well first to discuss other factors or possible causes of this condition. Factors which have been suggested are disuse, dietary deficiency, gastric hypacidity, repeated pregnancies, long-standing thyrotoxicosis, senescence and Cushing's disease.

The atrophy of disuse is a well recognized clinical entity. It is most often produced by immobilization in

a plaster cast; it occurs in a limb which is affected by a flaccid paralysis. It is undoubtedly a factor in the generalized osteoporosis seen in older persons as their lives become more sedentary. An important differential clinical point is the fact that the atrophy of disuse seldom involves the skull, even when a patient is bed-ridden. This fact often helps to differentiate the condition from mild hyperparathyroidism but does not help to differentiate it from postmenopausal osteoporosis. In the series of cases studied in this paper (summarized in the accompanying table) an attempt has been made to call attention to any possible part played by the atrophy of disuse in the individual cases. In case 20, for example, the sequence of events may have been an automobile accident, the fracture of some vertebrae due to an adequate cause and the atrophy of other vertebrae due to immobilization. There is evidence, however, that atrophy due to forced disuse is greater in patients after the menopause than before (case 34).

We do not have any definite convictions as to what part diet may or may not play in the causation of osteoporosis. Diet, of course, has everything to do with osteomalacia, but that is an entirely different disease. There are at least three ways in which diet might be thought to play a part. Some investigators apparently believe that the increased availability of calcium and phosphorus in the system as the result of a diet rich in these substances is a stimulus to osteoblastic activity and that a decreased availability leads to decreased osteoblastic activity. As far as we are aware, there is no evidence to support this point of view. If the amount of calcium and phosphorus in the diet has any effect on the causation of osteoporosis, it seems unlikely that it is by such a mechanism. A second possibility is that an increased availability of calcium and phosphorus in the system because of the diet would decrease the amount of resorption of bone. If such were the case, any primary hypofunction of the osteoblasts would be partially offset by the decreased resorption and the patient would be benefited. Such a hypothesis would explain the apparently beneficial effect obtained by some investigators<sup>11</sup> in the treatment of patients with osteoporosis with diets high in calcium and phosphorus and large amounts of vitamin D. We favor the second possibility; it is in keeping with the concept which has been frequently emphasized from this clinic that a diet high in calcium and phosphates prevents the decalcification due to hyperparathyroidism. Finally, as a third possibility, a diet inadequate in protein might lead to a negative nitrogen balance, and this in turn might make it impossible for the osteoblasts to lay down the necessary organic matrix, which is the first step in the formation of bone. We believe that some of the osteopathies which have been attributed to a lack of calcium and phosphorus in the diet are really due to protein starvation.

In the table it will be noted that there were few abnormalities in the diet in this group of cases, and we are inclined to minimize the effect of diet.

Before the part played by diet is passed by, however, it might be of interest to discuss two recent papers by Prof. E. Meulen-gracht,<sup>12</sup> of Copenhagen. This author uses the terms osteomalacia and osteoporosis interchangeably. The cases described,

2. Lawrence, J. V., and Riddle, Oscar: Studies on the Physiology of Reproduction in Birds: VI. Sexual Differences in the Fat and Phosphorus Content of the Blood of Fowls, *Am. J. Physiol.* **41**: 430, 1916.

3. Riddle, O., and Reinhart, W. H.: Studies on Physiology of Reproduction in Birds: Blood Calcium Changes in Reproductive Cycle, *Am. J. Physiol.* **76**: 660, 1926.

4. Hughes, J. S.; Titus, R. W., and Smits, B. L.: Increase in Calcium of Hens' Blood Accompanying Egg Production, *Science* **65**: 264, 1927.

5. Macowan, M. M.: Observations on Ductless Glands, Serum Calcium and Egg-laying in Fowl, *Quart. J. Exper. Physiol.* **21**: 383, 1932.

6. Riddle, O., and Dotti, L. B.: Blood Calcium in Relation to Anterior Pituitary and Sex Hormones, *Science* **84**: 557, 1936.

7. Kyes, P., and Potter, T. S.: Physiologic Marrow Ossification in Female Pigeons, *Anat. Rec.* **60**: 377, 1934.

8. Gardner, W. U., and Pfeiffer, C. A.: Skeletal Changes in Mice Receiving Estrogens, *Proc. Soc. Exper. Biol. & Med.* **27**: 678, 1938; footnote 20.

9. Pfeiffer, C. A., and Gardner, W. U.: Skeletal Changes and Blood Serum Calcium Level in Pigeons Receiving Estrogens, *Endocrinology* **23**: 485, 1938.

10. Bach, E.: Follikelhormon und Kalkstoffwechsel, *Klin. Wchnschr.* **16**: 230, 1937.

11. Bauer, Walter, and Marble, Alexander: Studies on the Mode of Action of Irradiated Ergosterol: II. Its Effects on the Calcium and Phosphorus Metabolism of Individuals with Calcium Deficiency Diseases, *J. Clin. Investigation* **11**: 1, 1932. Adams, M.; Boothby, W. M., and Snell, A. M.: Metabolic Studies in Osteoporosis, *Am. J. Physiol.* **114**: 383, 1936.

12. Meulen-gracht, E.: Osteomalacia of the Spinal Column from Deficient Diet or from Disease of the Digestive Tract: I. From Deficient Diet, *Acta med. Scandinav.* **101**: 138, 1939; II. Osteomalacia Achylia, *ibid.* **101**: 157, 1939.



however, are cases of what would be diagnosed in our clinic as "osteoporosis." The patients had normal serum calcium, phosphorus and phosphatase values. The disease was confined mostly to the spines. The first of these papers had to do with 6 patients in whom Meulengracht attributed the condition to faulty diet and the second paper with 9 patients in whom he attributed the condition to hypochylia, not necessarily achylia. Of these 15 patients, 11 were women who had passed through the menopause, and, in our opinion, they were probably suffering from postmenopausal osteoporosis. The osteoporosis of 1 of the men (case I) could be attributed just as well to the atrophy of disuse. The first symptom was a nocturnal epileptic attack which led to paralysis of the legs and caused the patient to be bedridden for a few weeks. It is common to fracture a perfectly normal vertebra in an epileptic attack,<sup>13</sup> and the immobilization due to the fracture would then lead to osteoporosis. The osteoporosis of the second male patient (case III) was less convincing than that of the female patients. Thus the statement was made that "there was calcium deficiency of the vertebrae, but not very pronounced." The third male patient (case XIV) entered the hospital with severe scurvy. The vitamin C deficiency in itself might have been a factor in the osseous disease. The roentgenograms did show definitely increased radiability of the vertebrae. The statement was made, however, that the anterior longitudinal ligaments were considerably ossified. It would be our opinion that this indicated that the patient was suffering from or had suffered from spondylitis, which is probably akin to rheumatoid arthritis, and that the atrophy was due to this condition. We have recently studied a similar case in which there were increased radiability of the vertebrae and calcification of the anterior longitudinal ligaments. This case was not included in the series here analyzed because there seemed to be a definite local cause for the disease of the bone. Meulengracht's case XV (the fourth male patient) was complicated. There was a twenty year history of dyspepsia at the end of which time a pyloric resection was done for pyloric stenosis due to a gastric ulcer. There was increased radiability of the spine, which almost surely was related to the gastrointestinal history. It would appear to us, therefore, that of these 15 cases 11 were probably postmenopausal osteoporosis and that the remaining 4 in men could easily be explained on other grounds. That diet or gastric hypoacidity was an important factor seems inadequately established although by no means disproved. The possibility remains that the prerequisites for the development of the disease are the postmenopausal state plus an inadequate diet.

Repeated pregnancies probably cause a drain on the body's supply of calcium and constitute a well known factor in the causation of osteomalacia. However, it is unlikely that pregnancy would have any effect on the causation of osteoporosis. It was considered, however, of interest to list in the table the number of pregnancies in the various cases.

There is an increased excretion of calcium in the urine and feces in cases of thyrotoxicosis.<sup>14</sup> Williams

and Morgan<sup>15</sup> presented some evidence that long-standing thyrotoxicosis leads to increased radiability of the skeleton.

It is perhaps of interest that all of their 7 patients were women, and, as was pointed out by them, that

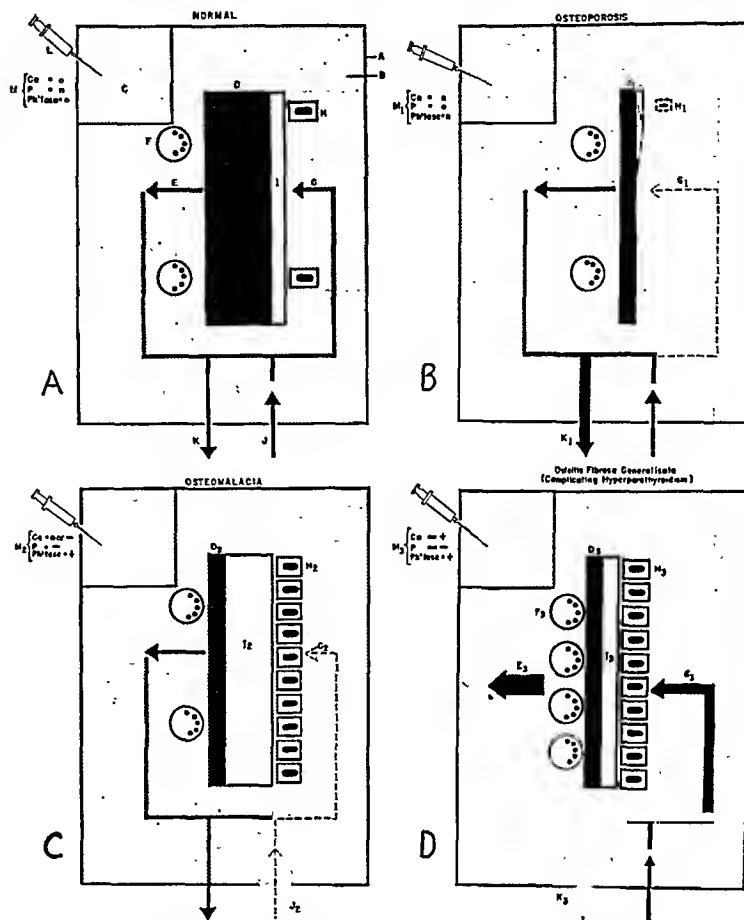


Fig. 1.—Schematic diagrams to show the authors' conception of differences among normal function of bone, osteoporosis, hyperparathyroidism with osteitis fibrosa generalisata and osteomalacia. A, body limits; B, body fluids; C, body serum, a compartment of fluid easy to tap for analysis; D, mass of bone with two surfaces, one at which bone is being resorbed and one at which it is being laid down; E, arrow indicating by its size the rate of resorption of calcium and phosphorus; F, osteoclast; G, rate of deposition of calcium and phosphorus; H, osteoblast laying down osteoid (I); J, calcium and phosphorus entering the body from the gastrointestinal tract; K, calcium and phosphorus leaving the body by the kidneys or by other exits; L, syringe obtaining serum for analysis, and M, blood values (n = normal, + = high and - = low).

A. Normal.—Note that the calcium and phosphorus going into bone equals that coming out of bone and that part of that which comes out goes back in.

B. Osteoporosis.—Note decreases in the mass of bone (D); primary hypoplasia of osteoblasts ( $H_1$ ); decreased deposition of osteoid ( $I_1$ ); decreased deposition of calcium and phosphorus ( $G_1$ ); increased excretion of calcium and phosphorus ( $K_1$ ), and normal blood values ( $M_1$ ).

C. Osteomalacia.—Note decreased mass of bone ( $D_2$ ); hyperplasia of osteoblasts because of increased stresses and strains ( $H_2$ ); increased deposition of osteoid which is inadequately calcified because of serum calcium and phosphorus values; decreased deposition of calcium and phosphorus ( $G_2$ ); primary difficulty in absorbing calcium and phosphorus from the gastrointestinal tract ( $J_2$ ); and abnormal blood values (calcium normal or low, phosphorus low and phosphatase high).

D. Osteitis fibrosa generalisata complicating hyperparathyroidism.—Note increased excretion of calcium and phosphorus in the urine ( $K_3$ ); increased resorption of calcium and phosphorus ( $E_3$ ); increase of osteoclasts ( $F_3$ ); decreased mass of bone ( $D_3$ ); increased formation of bone by osteoblasts ( $H_3$ ) because of increased stresses and strains; increased deposition of calcium and phosphorus ( $G_3$ ) because serum is not undersaturated in respect to calcium phosphate (i. e. the serum calcium level is sufficiently high almost to offset the low serum phosphorus content), and the high phosphatase level ( $M_3$ ).

5 were over the age of 50. We are not aware that histologic studies have been done on osseous material from patients with thyrotoxicosis, and the nature of the disease of bone is still unknown. Patients 38, 39 and 40<sup>16</sup> in the series here reported had a history of thyrotoxicosis. The osseous changes were similar from

13. Palmer, H. A.: Vertebral Fractures Complicating Convulsive Therapy, *Lancet* 2: 181, 1939.

14. Aub, J. C.; Bauer, Walter; Heath, C., and Ropes, M.: Studies of Calcium and Phosphorus Metabolism: III. The Effects of the Thyroid Hormone and Thyroid Disease, *J. Clin. Investigation* 7: 97, 1929. Fugley, L. I., and Anderson, E.: The Effect of Desiccated Thyroid, Irradiated Ergosterol and Ammonium Chloride on the Excretion of Calcium in Rats, *Biochem. J.* 28: 754, 1934. Puppl, I. D., and Curtis, G. M.: Calcium and Iodine Metabolism in Thyroid Disease, *Arch. Int. Med.* 58: 957 (Dec.) 1936.

15. Williams, R. H., and Morgan, H. J.: Thyrotoxic Osteoporosis, *Internat. Clin.* 2: 49, 1940.

16. Case 40 was previously reported as case 383 by J. H. Means (The Thyroid and Its Diseases, Philadelphia, J. B. Lippincott Company, 1937).

## Summary of Clinical Observations

Identification		Age and Time Data			Etiology			Symptomatology		
		Age and Date When Seen	Age at Menopause	Interval Between Menopause and First Symptom, Years	Diet	Number of Pregnancies	Evidence for Disuse Atrophy as a Factor	First Symptom and Precipitating Incident	Duration of Symptoms *	Disability
AFTER PHYSIOLOGIC MENOPAUSE										
1	Miss L. M.	65 1935	47	10	Generally poor; little milk until 7 yrs. before; 1 glass daily since	0	0	Fractured surgical neck of humerus in a fall	1 day	Fracture not united
2	Mrs. F. T.	65 1931	50	14	Drank milk	2	Inactive since fracture of 2 mos. duration; cast for 2 mos., then limited activity	Spontaneous fracture of both bones of lower right leg, without adequate trauma	1½	Unable to do housework for 2 years
3	Miss P. S.	65 1937	61	9	Little milk; meat once daily	0	Change from active to sedentary occupation	Spine "gave way" while pushing boat off dock; pain in lower back since	5	Feels insecure; cane, corset and brace
4	Miss E. F.	65 1934	35	31	½ pint milk daily for 10 yrs. before menopause; for next 10 yrs. 1 pint daily as beverage; once daily all her life	0	0	Pain in right iliac region following jolt in ear	3 mos.	..
5	Mrs. D. S.	64 1932	40	24	No data	5	Limited activity	Pain in legs with increasing weakness	4 mos.	Insecure
6	Mrs. M. M.	63 1934	52	9	Rarely ate meat; no milk	1	Bedridden for 3 wks. 1 yr. before seen; back strapped for 6 mos. thereafter	Continuous burning pain in back, arms and legs since "throwing brake" on car	2	Requires rest periods; corset and brace
7	Mrs. W. R.	63 1935	54	8	Drank no milk	5	0	Onset of severe pain in back while pounding tacks in footstool; had both weakness and pain on motion thereafter	1	Limited activity; corset and brace
8	Mrs. I. E.	63 1935	38	10	See "Comment"			Radiating pain in abdomen and back, thought to be arthritis; no precipitating incident	3 mos.	Corset and brace
9	Miss I. M.	62 1937	..	..	Some milk as a beverage for 5 yrs.	0	Cast for ankle 3 mos.; crutches for 2 mos. in addition	Slipped on steps and fractured ankle; later had pain in hips and lower part of back, especially on lying down	2	Walking painful; especially climbing stairs
10	Mrs. H. K.	62 1937	50	11	Milk in cooking, not as beverage; occasionally cottage cheese	4	Immobilization, 16 wks.	Fractured hip from fall on rug	1½	Fracture not united
11	Mrs. A. McD.	61 1939	47	13	1 glass to 1 pint milk daily as beverage and in cooking; no cottage cheese	0	0	Onset of sudden severe pain in right flank while sitting in church; numbness in left leg	5 mos.	Requires rest periods; care; corset and brace
12	Mrs. E. H.	60 1938	45	15	Little meat; a few vegetables and some butter; carbohydrates	3	0	Sudden pain in back on leaning forward	2 mos.	0
13	Mrs. E. P.	60 1939	53	6	Whole milk in cooking; cream in coffee and on cereal; no cottage cheese	..	Bedridden since injury	Pain in back since fall down six steps; landing in sitting position	1½	Bed most of the time; cane, corset and brace
14	Mrs. S. F.	59 1933	49	9	Always drank 1 glass of milk daily	2	0	Onset of sudden severe pain in left scapula while stooping forward	1	Generalized weakness
15	Mrs. F. H.	59 1933	48	10	Used milk in cooking only; ate meat and vegetables	5	0	Hit by trolley car; pain in back thereafter	1	..
16	Mrs. I. H.	59 1936	38	9	No milk	6	0	Fell on ice; entered hospital at once for pain in back	1 day	Pain and spasm; corset and brace
17	Mrs. R. C.	59 1936	38	14	No milk or cheese	2	0	Experienced "crack" in back on bending over; backache thereafter	7	Corset and brace
18	Mrs. D. G.	58 1932	50	7	No milk	2	Cast for 2 mos.; bedridden for 6 mos. because of fractured hip	Fell from street car and fractured hip; nonunion of fracture	9 mos.	Limp due to short left leg; corset and brace
19	Miss J. M.	57 1933	53	4	Moderate use of milk before menopause	0	0	Bent over and suffered sudden pain in back which persisted	1 wk.	Walks with cane
20	Miss M. M.	56 1937	48	7	No milk	0	0	Severe pain in left leg after fall on ice	1	Difficulty in walking, weakness; corset and brace
21	Mrs. M. W.	55 1934	44	11	No data	0	0	Fell on steps, striking knee and spine; severe back pain	1 day	0
22	Miss S. McA.	55 1930	45	7	Ate meat twice daily 10 yrs. before menopause, cottage cheese occasionally; 1 glass milk daily after menopause and more cheese in diet	0	Cast for 7 wks. for injury of back	Pain in back after severe jolt in ear	3	Corset and brace

\* The duration of symptoms is in years unless stated otherwise.

## in Forty-Two Cases of Osteoporosis

Roentgenographic Study					Serum Chemistry				Comment; Associated Diseases
Increased Radiability	Spine Deformed Vertebrae	Increased Radiability of Other Bones			Calcium, Mg. per 100 Cc.	Phosphorus, Mg. per 100 Cc.	Phosphatase, Bodansky Units per 100 Cc.	Protein, Gm. per 100 Cc.	
		Pelvis	Skull	Long Bones					
AFTER PHYSIOLOGIC MENOPAUSE									
+++	Ninth dorsal	++	—	++	9.6	3.6	3.0	6.4	Psychoneurosis; poor dietary habits for years
++	Multiple dorsal and lumbar	+++	—	—	10.1	3.1	...	7.2	Herpes zoster at 64; calcification of abdominal aorta; tuberculosis (old) of left knee causing spontaneous fracture; lower right tibia and fibula fractured without known trauma; died of pulmonary infarct
++++	Multiple middle lumbar and lower dorsal	0	+	0	10.4	3.6	4.8	5.9	Renal colic at 55 and 65; bilateral mastectomy for cystic mastitis; hypertension; gastric analysis; no free acid
++	First lumbar	—	—	—	10.6	4.4	...	...	In right kidney: hydronephrosis 1934; renal stone discovered 1 month after patient was placed in cast for fractured first lumbar vertebra in February 1935; later, nephrectomy
++	Multiple	+	+	—	10.5	3.6	...	...	Chronic cholecystitis; hypertension; unilateral oophorectomy 9 years after menopause for ovarian disease
++	Tenth and eleventh dorsal; first and second lumbar	—	++	+++	10.3	3.9	3.6	...	
+++	Multiple dorsal	+++	0	0	10.5	3.4	3.2	6.6	Gravel in urine at 55; mastectomy for cystic mastitis at 62; calcification of arteries; non-toxic nodular thyroid; amebic dysentery at 48 and 49
+++	Multiple dorsal and lumbar	+++	—	—	11.0	3.8	4.6	5.8	Typhoid in adolescence; "arthritis" since 48; hypertension; frequent attacks of gastrointestinal disorder, acute for 9 months; atony of the colon
+++	0	+++	—	+ See "comment"	...	4.4	3.5	6.0	Hypertension; left sacroiliac strain; right dorsal scoliosis
+	0	++	0	—	9.9	3.8	...	7.2	Gallstones and bilateral renal stones discovered while in traction 10 weeks for fracture; typhoid at 15 with gallstone colic; unable to walk for 2 years after typhoid
+++	Multiple	+++	0	+	10.9	3.2	4.1	5.7	Chordotomy for root pain; incontinence since
+++	Eleventh and twelfth dorsal; first lumbar	++	0	—	10.8	3.3	4.9	...	
+++	Seventh, ninth and twelfth dorsal; first lumbar	++	0	+	10.1	3.5	3.7	7.6	Dorsal kyphosis; cholelithiasis
+++	Multiple	+++	0	+	10.9	3.3	2.4	...	Calcification of aortic arch
+++	Twelfth dorsal; first, second and third lumbar	—	+	—	10.0	3.6	4.4	7.1	Arteriosclerosis, essential hypertension; pyelitis, asthma at 29
+++	Lower dorsal and first and third lumbar	++	0	0	10.1	3.7	4.4	5.7	Hypertrophic arthritis of hands; thyroid nodule (?)
++++	Twelfth dorsal and first lumbar	—	0	+	9.5	4.0	3.3	6.1	Heberden's nodes; kyphosis
++++	Eleventh dorsal	—	—	—	11.0	4.3	...	...	"Sour stomach"
++	Twelfth dorsal	++	0	0	11.7	4.0	...	...	Arteriosclerotic heart disease and arteriosclerosis; typhoid at 23; multiple sclerosis (?)
+++	Eleventh dorsal	+++	0	0	10.7	4.0	3.6	6.2	Actual cause of symptoms may have been ruptured disk rather than osteoporosis; arteriosclerosis ++; neuritis of left sciatic and femoral nerve
+++	First lumbar	+++	—	0	10.8	3.4	3.6	...	Fractured surgical neck of humerus at 50; asymptomatic syphilis at 19, Wassermann weakly positive
+++	Multiple dorsal and lumbar	..	—	—	9.3	3.5	2.9	...	Typhoid at 35; history of gastric ulcer

## Summary of Clinical Observations in

Identification		Age and Time Data			Etiology			Symptomatology		
		Age and Date When Seen	Age at Menopause	Interval Between Menopause and First Symptom, Years	Diet	Number of Pregnancies	Evidence for Disuse Atrophy as a Factor	First Symptom and Precipitating Incident	Duration of Symptoms	Disability
23	Mrs. M. F.	54 1939	51	2	No milk	3	..	Fell on left side, turned ankle and wrenched back; later, pains radiating from spine	2	Legs weak; fatigues easily
24	Mrs. E. D.	49 1931	38	7	Normal diet but did not care for milk until 1931; milk and cheese continuously since	3	0	Gradual onset of Pain in back brought on by change in position	2	Corset and brace
25	Mrs. I. B. T.	49 1938	46	3	1 glass milk every other day before 1933; 3 glasses milk daily since	No data	0	Pain in back on bending over	3 mos.	0
26	Mrs. R. F.	49 1937	41	3	No milk	1	0	Pain in shoulders and back	3	Corset and brace
27	Mrs. K. M.	47 1932	40	6	Little calcium in diet	2	0	Vague skeletal pains	..	0
AFTER ARTIFICIAL MENOPAUSE										
28	Mrs. M. S.	64 1940	41	14	2 glasses of milk a week as beverage	8	0	Shortening stature and rounding of back, with pain	9	Corset and brace
29	Mrs. M. G.	63 1936	33	28	No milk	6	..	Severe pain in lower part of back on closing upper sash of window	2	Lumbosacral portion of spine rigid
30	Miss A. T.	62 1935	43	19	No milk, meat or eggs	0	Has used crutches or cane since fracture of femur at 56	Severe back pain on motion since fall backward after tripping over rug	1 mo.	..
31	Miss E. S.	60 1936	32	21	Moderate amount of milk on cereal and in cooking; has eaten meat and varied diet all her life	0	Almost bedridden for 7 yrs; cannot walk alone	.....	7	Depends on crutches; teaches dress design sitting
32	Mrs. A. R.	58 1935	45	10	1 glass milk daily as beverage; milk in cooking; cheese frequently; high calcium and protein diet since 53	5	Changed to sedentary work at 54	Onset of severe pain between the shoulders while trying to raise upper sash of a window	4	Cautious activity with corset and brace
33	Miss I. S.	53 1938	52	10 mos.	No milk	0	0	Pain in knees, hips and lower part of back; pain in left shoulder	1 day	0
34	Miss T. M.	51 1938	33	13	Drinks little milk	0	Confined to bed 3 mos. at 33 after oophorectomy	Turned ankle and injured knee cartilage; pain and swelling of knee	5	Crutches, plaster cast on right knee
35	Mrs. C. DeN.	51 1940	36	13	A little milk used in coffee only before menopause; meat usually once daily	3	0	Pain in left sacro-iliac region	2	Limitation of motion on bending backward
36	Mrs. M. B.	49 1938	28	14	Always 1 glass milk daily as beverage; occasionally cheese; always ate meat and vegetables; 1 pint milk daily since 1938	2	..	Sudden onset of pain in right shoulder and limitation of motion while driving automobile	2	Limited shoulder motion
37	Mrs. F. F.	42 1938	41	9 mos.	Daily milk 1924-1927; occasionally cheese	0	..	Gradual onset of back pain with increasing dorsal kyphosis; no precipitating cause	1	Active but uses corset and brace
COMPLICATED BY HYPERTHYROIDISM										
38	Mrs. A. L.	60 1932	50	..	No use of milk; occasional use of cheese all her life	4	..	Gradual onset; no symptoms attributable to osteoporosis	..	Lateral curvature; corset and brace
39	Mrs. H. R.	60 1936	45	..	3 glasses milk a day up to age 20; 4-6 oz. cottage cheese; since menopause, 1 glass milk as beverage, 1 oz. cottage cheese daily	1	..	Symptoms of osteoporosis not complained of; marked by other symptoms	..	Limited activity; corset and brace
40 <sup>16</sup>	Mrs. B. S.	50 1931	..	..	Low calcium and protein diet until 50, when first under care	0	..	Sudden onset of knife-like pain in lumbar region while driving automobile	3 mos.	Little activity; corset and brace
MEN										
41	Mr. V. S.	60 1935	..	..	No milk	..	Changed to sedentary occupation 8 yrs. before	Symptoms probably not attributable to osteoporosis	2	Legs weak; uses cane; epauletted gait
42	Mr. H. B.	48 1939	..	..	No milk or cheese	..	..	Experienced sharp pain and heard snap in region of twelfth dorsal vertebra after twist of back while playing golf	3	Amble along with cane; bent over; wears brace

## Forty-Two Cases of Osteoporosis—Continued

Roentgenographic Study					Serum Chemistry				Comment; Associated Diseases
Spine		Increased Radiability of Other Bones			Calcium, Mg. per 100 Cc.	Phosphorus, Mg. per 100 Cc.	Phosphatase, Bodansky Units per 100 Cc.	Protein, Gm. per 100 Cc.	
Increased Radiability	Deformed Vertebrae	Pelvis	Skull	Long Bones					
+++	Tenth dorsal; first, third, fourth and fifth lumbar	++	0	+	10.1	3.3	5.1	7.3	Area of Paget's disease of left side of ilium; calcification of abdominal aorta
+++	Multiple	+++	+	+	10.5	3.2	6.2	...	Calcification of aorta; operation for chronic cystic mastitis; symptomatic improvement after changes in diet
+++	0	—	+	—	10.6	3.2	4.1	...	Dorsal kyphosis; lower dorsal scoliosis
+	Multiple	+	—	0	11.0	4.2	...	...	Stone in left kidney (?); kyphosis
++	Lumbar	+	+	+	10.3	3.1	2.3	...	Osteitis fibrosa localisata of left radius; diagnosed after traumatic fracture; hyperparathyroidism ruled out; cholecystectomy at 46
AFTER ARTIFICIAL MENOPAUSE									
+++	Multiple dorsal	—	0	+++	11.5	2.8	6.7	...	Syphilis of at least 11 years' duration; at least 5 pregnancies terminated in abortions
+++	Sixth, seventh and ninth dorsal; first and fifth lumbar	+++	0	+	10.6	3.5	3.6	...	Mushroom deformity of both wrists; absence of styloid process; old thoracic goiter
++++	First, third, fourth and fifth lumbar	++++	0	++	9.3	4.4	5.9	6.0	Hysterectomy and bilateral oophorectomy at 43; gastric ulcer at 56; ununited fracture of femur at 56; hypertension; aortic calcification
+++	Second, sixth, ninth, eleventh and twelfth dorsal	+++	—	+++	10.4	3.7	4.0	7.8	Bilateral oophorectomy at 32; cystic ovaries; fractured arm at 54; typhoid at 25; aortic calcification
+++	Multiple dorsal and first lumbar	+++	+	0	10.1	3.0	3.7	6.3	Radium treatment for fibroid tumors at 45; typhoid at 27
++	0	+	—	+	11.3	3.9	4.5	7.6	Bilateral oophorectomy at 52
++	0	++	+	+++	10.0	3.6	4.5	4.9	Menopause at 33 after operation for uterine fibroid; hot flashes have persisted ever since; a total of more than 35 rib fractures; multiple fractures and sprains of legs and feet and ankle (especially dense end plates on vertebral bodies)
+	0	+	—	—	11.1	4.0	5.6	7.6	Bilateral oophorectomy at 36; indentation not known
++	First and second lumbar	++	—	+	10.8	3.6	3.6	...	Bilateral oophorectomy at 28; hysterectomy at 32; subachromial bursitis
+++	Multiple lumbar and dorsal	+	0	0	10.5	4.2	3.6	7.3	Oophorectomy at 41 for endometriosis; operation followed by nocturnal seizures, exact nature of which has not been determined
COMPLICATED BY HYPERTHYROIDISM									
++	0	—	—	—	9.3	3.8	...	...	Operation for severe hyperthyroidism December 1932; mild diabetes mellitus; arteriosclerosis
++	0	+	—	—	10.1	4.6	3.3	...	Subtotal thyroidectomy for hyperthyroidism, 1936; aortic calcification
+++	First and fifth lumbar	+++	0	+	10.5	3.5	3.0	7.0	Thyroidectomy at 41 (1922) for long-standing exophthalmic goiter (12 yrs.); slight residual thyrotoxicosis thereafter; arteriosclerosis; hypertensive heart disease; congestive failure
MEN									
++	Seventh and ninth dorsal; first and fifth lumbar	++	0	+	10.3	4.0	2.4	...	Rickets as a child, requiring use of brace; hypertrophic arthritis
++++	Multiple dorsal and lumbar	++++	+	+	10.5	3.2	3.6	6.7	Coronary thrombosis at 43; calculus in left kidney at 46; in right kidney one month later

a clinical point of view to those seen in typical postmenopausal osteoporosis.

All 3 of these patients were women who had experienced the menopause. It is believed that the menopause alone could have accounted for all the osseous changes. Whether the thyrotoxicosis was an associated factor or the only factor cannot be stated.



Fig. 2 (case 13 in table).—Crushed vertebra.

The bones, like so many other tissues (skin, hair, elastic tissue) atrophy in old age in both sexes. Fracture of the hips of very old people is a common clinical manifestation of this process. This atrophy is osteoporosis and is generally designated "senile osteoporosis." In the group of cases here reported we were not concerned with senile osteoporosis, and we have arbitrarily omitted all cases of osteoporosis occurring after the age of 65.

Since the osteoporosis of Cushing's syndrome is probably closely related to that occurring after the menopause, it will be discussed after menopausal osteoporosis.

#### CLINICAL CHARACTERISTICS OF POSTMENOPAUSAL OSTEOPOROSIS

Some clinical data on 42 cases of osteoporosis are tabulated. The chief argument for the existence of postmenopausal osteoporosis, other than the beneficial effects of estrogen on the calcium metabolism<sup>17</sup> in these cases, is the frequency with which osteoporosis occurs in women after the menopause. Thus the 42 cases listed in the table represent all the cases of generalized osteoporosis without an obvious cause, such as infantile paralysis, which have come to our attention or which we have been able to find in the hospital diagnosis index since the year 1931. Patients over 65 years of age have been excluded because of the possibility of senescence as a factor (as noted previously). By the term "generalized osteoporosis" it is not implied that the

osteoporosis involves all the bones of the body but that it is not confined to a local region such as one vertebra or one extremity.

Of the 42 patients, 40 were women who had passed the menopause. Two were men (cases 41 and 42); no explanation for the osteoporosis of these was apparent. In no instance did the condition occur in women before the menopause. That this is not just a matter of age is not entirely disposed of by the 10 women in whom osteoporosis occurred with artificial menopause, since the ages of these 10 women were not strikingly different from those in the group of patients with physiologic menopause. Case 36 was interesting, however, in this connection in that the patient underwent an artificial menopause at the age of 28 and her symptoms developed at the age of 42. The average time of onset of symptoms after the menopause was nine and one-half years in the 27 cases of uncomplicated physiologic menopause and thirteen and two-fifths years in the 10 cases of artificial menopause. The difference between these two values is not statistically significant.

It will be seen from the table that postmenopausal osteoporosis has a predilection for the spine and the pelvis; long bones are involved only in the cases of more severe involvement. The skull is notable for its lack of involvement; this is an important point in differentiating postmenopausal osteoporosis from hyperparathyroidism, since in the latter condition the skull is one of the first bones to show roentgen evidence of involvement. The spinal lesions consisted of fractured or crushed vertebrae (fig. 2), the so-called fish vertebrae (fig. 3) and herniation of the nucleus pulposus through the end plates of the vertebrae, or "schmorlsche knoetchen" (fig. 4).

The commonest syndrome is that due to a vertebral lesion. Essentially the same story keeps repeating itself: A woman, about ten years after the menopause, receives a minor jolt (by going over a bump in an automobile, for example); she experiences a pain in the back; finally she has a roentgen examination which reveals the condition. This examination may be made for some other malady, and in these instances there may be no symptoms. Since, as previously discussed, there is an increased excretion of calcium in the urine in the early stages of osteoporosis, it is not surprising that some patients with this condition have urinary calculi. Patient 7,



Fig. 3 (case 24 in table).—So-called fish vertebra. Note that intervertebral disks have expanded into vertebrae, converting them into biconcave disks.

17. Albright, Fuller, and Bloomberg, Esther, to be published.



for example, noted the passing of gravel on frequent occasions for one year after the menopause, which occurred at the age of 54. There were then no further symptoms until nine years later, when she experienced a severe pain in the back while pounding some tacks into a footstool. Patients 3, 4, 10 and 26 also had histories of urinary calculi (as did patient 42, one of the two men in the series). On physical examination patients with osteoporosis tend to show their age prematurely. Their skin is noticeably thin, this condition suggesting that the atrophy is more widespread than just in the bone matrix.

#### CUSHING'S DISEASE

The pathologic condition of bone associated with Cushing's disease is osteoporosis and has many of the clinical characteristics of postmenopausal osteoporosis. We have studied 5 patients (2 with adrenal cancers and 3 without) who will be the subject of a separate report.<sup>18</sup> In this disease there is a decrease or an absence of the formation of estrogen and, in addition, an increase in urinary androgens.<sup>19</sup> It is interesting that Gardner and Pfeiffer<sup>20</sup> have found that testosterone inhibits the effect of estrogen on the formation of bone in doves, and it may be that the excessive androgens in Cushing's disease cause the osteoporosis to be so severe. It may be partly for this reason, too, that we have found estrogen ineffective in Cushing's disease in producing a positive calcium balance.<sup>18</sup> However, in our opinion,<sup>21</sup> the most important factor in the causation of the osteoporosis in Cushing's disease is the negative nitrogen balance due to an increased conversion of protein into sugars.

#### MENOPAUSAL OSTEOPOROSIS COMPLICATED BY PAGET'S DISEASE

Case 23 in the table is of much theoretical interest in that postmenopausal osteoporosis was superimposed on Paget's disease. The net result was what one would have expected. It is the belief of one of us (F. A.) from unpublished data that the sequence of events in Paget's disease is (a) destruction of bone due to an unknown cause, (b) osteoblastic stimulation due to increased stresses and strains and (c) overgrowth of bone and increase of the serum phosphatase level as a result of osteoblastic stimulation. Thus if Paget's disease were superimposed on osteoporosis one would expect steps b and c to be missing because of the primary hypofunction of the osteoblasts. Patient 23 had a normal phosphatase level, and the roentgenogram showed any evidence of overgrowth of bone in the area of Paget's disease to be lacking.

Another example of the two conditions occurring in the same patient was recently seen (Mrs. M. L.). The patient was 62 years of age and had had a physiologic menopause at the age of 44. She had been under treatment for pernicious anemia for four years. She had advanced atrophy of the skin and had had a vulvectomy for kraurosis. There was advanced osteoporosis of the

spine and pelvis, but no fractures of the vertebrae. The extraordinary feature of the case, however, was the patient's skull. The whole top of the head was flat and soft, and the pulsations of the brain could be felt and seen. The roentgenogram showed extreme decalcification of the skull due to Paget's disease. Here again steps b and c were left out, in all probability because



Fig. 4 (case 13 in table).—Herniation of nucleus pulposus through end plate of vertebra ("schmorlische knoetchen").

of superimposed postmenopausal osteoporosis. The patient's serum calcium was 9 mg., serum phosphorus 3.2 mg. and serum phosphatase 15.7 and 21.9 Bodansky units per hundred cubic centimeters.

#### POSTMENOPAUSAL OSTEOPOROSIS COMPLICATED BY HYPERPARATHYROIDISM

In a previous publication from this clinic<sup>22</sup> a case was described in which the combination of osteoporosis with hyperparathyroidism was present. Hyperparathyroidism when it does cause disease of bone does so by increasing destruction of bone. Normally this process is partially met by increased repair of bone due to osteoblastic activity, and the phosphatase level is high. If the condition is complicated by osteoporosis the osseous changes will be out of proportion to the degree and the duration of the hyperparathyroidism, and the phosphatase level will be unexpectedly low for the degree of decalcification.

#### SUMMARY AND CONCLUSIONS

1. Calcium deficiencies of the skeleton due to metabolic disorders are divided into those due to increased resorption of bone and those due to decreased formation of bone; deficiencies due to decreased formation of bone are further subdivided into those in which calcium is not deposited in osteoid tissue (osteomalacia or rickets) and those in which the osteoblasts are primarily deficient in laying down osteoid tissue; this is osteoporosis.

22. Albright, Fuller; Sulkowitch, H. W., and Bloomberg, E. H.: Further Experience in the Diagnosis of Hyperparathyroidism, Including a Discussion of Cases with a Minimal Degree of Hyperparathyroidism, *Am. J. M. Sc.* 193: 800, 1937.

18. Albright, Fuller; Bloomberg, Esther, and Parsons, W.: The Effect of Estradiol Benzoate and Testosterone Propionate on the Disordered Calcium, Phosphorus and Nitrogen Metabolisms in Two Cases of Cushing's Syndrome Without Adrenal Tumors, read before the Twenty-Fourth Annual Scientific Session of the Association for the Study of Internal Secretions, New York, June 11, 1940.

19. Crooke, A. C., and Callow, R. K.: The Differential Diagnosis of Forms of Basophilism (Cushing's Syndrome) Particularly by the Estimation of Urinary Androgens, *Quart. J. Med.* 8: 233, 1939. Fraser, Forbes, Albright, Sulkowitch and Reifenstein.<sup>21</sup>

20. Gardner, W. U., and Pfeiffer, C. A.: Inhibition of Estrogenic Effects on Skeleton by Testosterone Injections, *Proc. Soc. Exper. Biol. & Med.* 38: 599, 1935.

21. Fraser, R.; Forbes, A. P.; Albright, Fuller; Sulkowitch, H. W., and Reifenstein, E. C., Jr.: Colorimetric Estimation of "Seventeen Ketosteroids" in Urine: A Survey of the Use of This Test in Endocrine Investigation, Diagnosis and Therapy, *J. Clin. Endocrinol.*, to be published.

2. Emphasis is placed on the fact that osteoporosis is not a disorder of calcium metabolism but rather an atrophy of the bone matrix.

3. Factors in the causation of osteoporosis are disuse and senescence; that faulty diet is a factor, in our opinion, has not been established.

4. Because of the constant tendency of osteoporosis to occur in women after the menopause and the beneficial effect of estrogen therapy on the retention of calcium in this condition, we believe that the postmenopausal state is the most common etiologic factor.

5. Of 42 patients under the age of 65 with generalized osteoporosis, 40 were women who had gone through the menopause (physiologic 30 cases, artificial 10 cases); only 2 were men; there were no cases in women before the menopause.

6. Three of the 42 patients had had thyrotoxicosis; whether this had been a factor in the causation of the disease it is impossible to state.

7. Postmenopausal osteoporosis has a predilection to involve the spine and the pelvis; the long bones are less likely to be involved; the skull, in contrast to osteitis fibrosa generalisata, is almost never involved.

8. There is considerable evidence that patients with postmenopausal osteoporosis have a tendency to atrophy of other tissues, notably the skin.

9. In 2 cases postmenopausal osteoporosis was complicated by superimposed Paget's disease; the modification of the latter disease by the former is noteworthy.

10. One case of postmenopausal osteoporosis was complicated by superimposed hyperparathyroidism; the latter disease was modified by the former.

## TREATMENT OF DEMENTIA PARALYTICA

### A FIVE YEAR COMPARATIVE STUDY OF ARTIFICIAL FEVER THERAPY AND THERAPEUTIC MALARIA IN TWO HUNDRED AND THIRTY-TWO CASES

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This is a report of a five year study comparing the therapeutic efficiency of artificial fever therapy and of therapeutic malaria. The preliminary report of this study was made in 1936.<sup>1</sup> There is nothing unique in the use of either malarial therapy or artificial fever, the former having been advocated by Wagner von Jauregg's original report in 1917 and the latter by Neymann and Osborne<sup>2</sup> in 1929. For reasons not entirely clear to us certain clinics treating patients with neurosyphilis have been skeptical of the therapeutic value of artificial fever in this neuropsychiatric disorder. Because of this apparent prejudice against a new method we felt it wise to observe a series of patients, taking alternate patients in the series for treatment with each method. Patients were assigned to the artificial fever or malaria series in alternation as they were admitted to the Colorado

Psychopathic Hospital and Clinic, that is, patient 1 went to the malaria series, patient 2 to the artificial fever series and so on. The postfever care has been according to the same plan in all cases from both series and has consisted of intensive chemotherapy with trypanamide, neoarsphenamine and bismuth compounds according to the plan given in the accompanying outline.

Since the inauguration of this study there have been numerous reports<sup>3</sup> advocating the use of artificial fever therapy in the treatment of neurosyphilis and others reporting on the present status of therapeutic malaria.<sup>4</sup> The best statistical analysis of a comparison of the therapeutic efficiency of the two methods used independently has been made by the Cooperative Clinic Group.<sup>5</sup> The historical background of this study was traced in the preliminary report and will not be repeated here.

## METHOD

All patients treated by both methods were subjected to detailed clinical and laboratory studies before treatment was instituted. All were studied by one of us. The treatment of all patients in both the malaria and the artificial fever series was administered in this clinic under our direct observation and supervision. Follow-up studies were made at six month intervals in the outpatient department of the Colorado Psychopathic Hospital except when the patients were incarcerated in the Colorado State Hospital. In such cases the follow-up studies were made by a physician from the Colorado Psychopathic Hospital. The majority of the postfever chemotherapy was administered in the outpatient department of the Colorado Psychopathic Hospital, although a few patients received their treatment from private physicians according to our therapeutic plan. Because of the cooperation of these private physicians and the staff of the Colorado State Hospital there is little difference in the type of follow-up care of these patients treated outside the Colorado Psychopathic Hospital Clinic. Social data, appointments for follow-up examinations and general aid in keeping track of the patients were handled efficiently by a trained psychiatric social worker who has this study as her principal duty. All follow-up examinations were made by a trained psychiatrist on duty in this hospital or in the Colorado State Hospital. The physicians making these follow-up studies were not aware of which type of fever therapy the patient had originally received. The patients in the malaria series in most instances received fifty hours of fever at 104 F. or more, although at times the patient's condition would not allow this amount of fever to be given. In the first three years of the study patients in the artificial fever series received fifty hours of fever at rectal temperatures of 105 F. to 106 F., given as ten treatments of five hours each. During the last two years of the study the artificial fever group received only thirty-six hours of fever but at a rectal tempera-

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ture of 105.8 F. given as twelve treatments of three hours each. We could notice no difference in the results obtained from the shorter, more frequent treatments, and it enabled us to treat a greater number of patients in the artificial fever department. After fever therapy by either method complete laboratory and clinical studies were again made. Patients responding favorably were

*Outline of Treatment of Dementia Paralytica at the Colorado Psychopathic Hospital*

Therapeutic Malaria Fifty hours at 104 F. Eight to ten chills No chemotherapy possible	or	Artificial Fever Therapy Thirty-six hours at 105.8 F. Twelve three hour treatments Simultaneous chemotherapy
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Follow-Up Treatment

A. First year:

- Six months of trypanamide, 3 Gm. weekly
- Physical, mental, neurologic and complete serologic check-up
- Four months of bismuth salicylate, 0.26 Gm. weekly
- Two months of neosphenamine, 0.6 Gm. weekly
- Repeat examinations outlined under (b)

B. Second year:

Repeat procedure outlined for first year

C. Third year:

Repeat procedure outlined for first year

All treatment is continuous. Eyscgrounds and visual fields must be checked frequently. Repeat series as often as necessary. Patients not improved after three years will probably not benefit from further treatment.

transferred to the outpatient department and reported weekly for follow-up treatment. A small percentage returned to their private physicians for follow-up care, but they were encouraged to return to the clinic each six months for reexamination. The social worker keeps a rotating roster, and each six months each patient's name appears automatically. She then makes contact with the patient and arranges for a reexamination in the clinic. Those patients transferred to the state hospital in Pueblo are checked in that institution. We have had the usual difficulty in following our patients in their travels about the country, but the assignment of a social service worker to the task of getting the patients in for examination has made our follow-up treatments and examinations more complete than was possible prior to the inauguration of this system. For example, we were able to follow all of our patients treated with malaria and reported in the preliminary study<sup>1</sup> and 66 per cent of the artificial fever series studied in the same group for the entire five years or until they died. The periodic reexaminations consist of complete physical, neurologic and mental check-ups and serologic examinations of the blood and spinal fluid. It is interesting to note that most of the patients lost sight of during the follow-up period were patients who responded favorably to treatment and after two or three years of follow-up care felt free of symptoms and refused to come back for further examination. Some of those lost sight of moved out of the state and could not be reached. Most of the patients doing poorly have been admitted to the state hospital or have continued to come to this clinic seeking aid for their trouble. The deaths are, as far as we know, all recorded in the data.

# RESULTS

The statistical evaluation of the results of any clinical research study is difficult at best. In a disease such as neurosyphilis there are so many variables, such as the duration of the infection before treatment, the type and quantity of prefever chemotherapy, the age and the physical and social status of the patient, that any sta-

tistical presentation is open to criticism. A detailed statistical analysis of a large group of cases was made by the Cooperative Clinical Group.<sup>5</sup> We supplied a number of the cases in that study, and both the fever and the malaria series of the first year were included in that survey. We do not feel competent to make a detailed statistical breakdown of our data. We wish to present our general results and to mention certain trends noted in individual cases.

That the series are fairly comparable is indicated by the fact that 32 per cent of the patients in the artificial fever series and 31 per cent of those in the therapeutic malaria series were persons with advanced or so-called group A dementia paralytica. The average age of the artificial fever group was 40 years, and the average of the malaria group was 42.6 years, and the duration of symptoms prior to treatment was twenty-two and four-fifths months in the fever group and seventeen and one-fifth months in the malaria group. The data concerning prefever chemotherapy included vague recollections of "shots" taken years before the development of dementia paralytica as well as accurate clinical records from other hospitals and clinics. The reliability of the data varied so greatly in both series that no attempt was made at any evaluation of the influence it may have had on the course of the disease.

It will be noted in table 1 that more patients were treated by artificial fever than by therapeutic malaria. This was not due to variation in the selection of cases, but we have included in the artificial fever group 37 patients rejected from the comparative study because of the presence of diabetes, healed tuberculosis, cerebral arteriosclerosis, chronic nephritis and mild cardiac decompensation. Patients suffering from these disorders are not suitable for malaria therapy but may be given artificial fever with caution. In some instances the rectal temperature of the artificial fever was lowered to 104 F. It was felt, however, after a study of these cases that they should be lumped with the other cases suitable for either form of treatment in that these disorders probably do not greatly influence the course of the neurosyphilis other than by contraindicating malaria therapy. The results in this small group did not significantly alter the general picture.

TABLE 1.—Types of Treatment and Clinical Results

Clinical Status	Artificial Fever		Therapeutic Malaria	
	No. of Cases	Per-centage	No. of Cases	Per-centage
Remission.....	25	19	7	7
Improved.....	68	50	50	51
Unimproved.....	31	22	27	27
Died within three months of treatment.....	2	1.4	5	5
Died subsequently.....	8	6.6	9	9
Total.....	134	99	98	99

The general results of the study are included in table 1. Remission or improvement was noted in 69 per cent of the artificial fever group as compared with 58 per cent in the therapeutic malaria group. By remission is meant the condition of patients who are showing no clinical symptoms of their disorder and who have been able to resume their previous role in the community. Improved patients are those who are definitely better than when treatment was instituted but are operating at a lowered level of efficiency. The inter-

esting fact is that there was approximately the same difference between the two series in the preliminary or first year of this study. In other words, the rate of improvement during follow-up care and the rate of relapse are approximately the same in the two series, and the difference in our hands seems to be a difference in immediate results.

TABLE 2.—Group Classification in Relation to Clinical Results

Clinical Status	Artificial Fever						Therapeutic Malaria					
	Group A		Group B		Group C		Group A		Group B		Group C	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Remission.....	0	0	16	23	9	45	0	0	4	7	3	25
Improved.....	18	41	39	54	11	55	9	29	35	64	6	50
Unimproved.....	19	43	12	17	0	0	15	48	11	20	1	8
Died.....	7	16	3	4	0	0	7	23	5	9	2	17
Total.....	44	100	70	95	20	100	31	100	55	100	12	100

We cannot be certain as to the reasons for this difference, but some of the factors which may play a role will be mentioned. The most important difference in the two series may be the fact that with artificial fever therapy the patients may be safely treated at higher levels of temperature than is possible with therapeutic malaria. The importance of high levels of temperature has been shown by the Cooperative Clinical Group study.<sup>6</sup> Another factor which may play a role is that patients usually gain weight during artificial fever therapy and in most instances are in better physical condition at the conclusion of the febrile period than when it was first instituted. The patients with malaria, on the other hand, usually lose weight and have some degree of anemia in spite of energetic attempts to prevent it. We originally felt that the difference was largely due to the fact that we administered trypanamide with each artificial fever treatment. In order to check on this for the last two years of this study we did not give trypanamide during the period of fever. In place of this, half of the patients with artificial fever received 0.3 Gm. of neoarsphenamine and 0.26 Gm. of bismuth salicylate during every other heating and the other half of the patients treated with artificial fever during the same period received no chemotherapy. We could see no significant difference between the two groups, nor could we see any significant difference between them and the larger group receiving trypanamide with their heating. Therefore we believe that the first two factors are the important ones, although the added chemotherapy must be of some benefit even though it failed to be statistically significant in this relatively small series.

Table 2 presents the clinical results according to the severity of the infection. Group A is advanced or severe dementia paralytica, group B the intermediate and group C the mild form. Detailed definitions of this grouping are contained in the original article.<sup>1</sup> The results are good with both methods in the mild cases and treatment becomes progressively less effective as the severity of the process increases. We obtained no true remissions in the advanced or A group by any form of treatment, but in many instances we were able to bring about definite improvements by either method of nonspecific treatment. The report of the Cooperative Clinical Group<sup>5</sup> showed artificial fever to be ten times as effective as therapeutic malaria in advanced dementia paralytica. Our study also shows a superiority of the artificial fever method in this group (table 2) but a superiority of only 12 per cent.

Our experience parallels that of Solomon<sup>6</sup> and others that intensive follow-up chemotherapy is essential if optimum sustained results are to be obtained. The variation in results reported from various clinics might be explained on the basis of care in follow-up treatment and examinations. The fact that the results in our series are superior to those reported in some clinics and inferior to others may well be due to this fact. We have found that in recent years the employment of a social worker and a greater drive to keep patients coming in for treatment and check-ups have certainly increased the beneficial results obtained in the patients given malaria therapy as compared to those patients treated with malaria before this study was inaugurated. For example, in the years 1925 to 1931 we treated 219 patients with dementia paralytica with therapeutic malaria. Of this group 45.6 per cent showed a remission or improvement. Our present malaria series reveals that 58 per cent of the patients are in some manner improved by the treatment, which means an improvement of 12.4 per cent in results from therapeutic malaria in the present study. We believe that this difference is due largely to greater care during the course of the malaria and greater emphasis on follow-up chemotherapy and supervision. Both of these groups were treated with therapeutic malaria in this hospital and, incidentally, with the same strain of tertian malaria.

The serologic response appears to show a greater modification in the group treated with artificial fever (table 3). The difference in results is not great and roughly parallels the difference in the rate of clinical remission. While we noted no direct correlation between alteration in serologic conditions and clinical remission in individual cases, we do find a higher percentage of serologic reversals in the group in both series showing great improvement than in those showing less improvement or no change in clinical status. Reversal or even great alterations in the serologic state immediately after the course of fever or malaria were rare but when they did occur seemed to indicate a good clinical prognosis. In several cases, on the other hand, great clinical improvement has been maintained in persons with spinal fluid persistently positive for syphilis. In our small series a decrease in the cell count and protein of the spinal fluid to within normal limits immediately

TABLE 3.—Serologic Results in Cerebrospinal Fluid

Clinical Status	Artificial Fever		Therapeutic Malaria	
	Number of Cases	Percentage	Number of Cases	Percentage
Reversed.....	15	11	6	6.1
Improved.....	47	35	28	23.5
Unmodified.....	47	35	40	40.8
Unable to check.....	25	18	24	21.4
Total.....	134	99	98	99.8

after treatment with artificial or malarial fever usually indicated that a considerable alteration or reversal of the Wassermann reaction and the colloidal gold curve was to be expected in six to twelve months provided the patient continued on the program of postfever chemotherapy. The changes in the status of the blood serum are inconstant and of practically no value in evaluating either the clinical course or the status of the spinal fluid.

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## CONCLUSIONS

In a five year study 232 patients with dementia paralytica have been treated with either therapeutic malaria or artificial fever therapy. The follow-up therapy in the two groups has been as nearly identical as the vagaries of clinical practice will allow. The method of therapy with artificial fever has been safer and has been productive of better results. The importance of follow-up care is emphasized. Improvement in the care of patients during malaria therapy and more attention to follow-up medication has improved the results of malaria therapy in our clinic, although these results still remain inferior to the results obtained with artificial fever therapy.

Patients with physical contraindications to therapeutic malaria may, in many instances, be safely treated with artificial fever therapy. Either method is reasonably efficient if properly managed and if general follow-up treatment and care are adequate.

The serologic responses roughly parallel the clinical results in the two series. Careful, periodic, clinical reexamination offers the best guide for therapy and gives the most reliable data for evaluation of results.

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CALCIUM DEPOSITS IN THE SHOULDER  
AND SUBACROMIAL BURSITIS

A SURVEY OF 12,122 SHOULDERS

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The title of this paper is purposely indefinite. It is intended to cover calcium deposits observed in the tendons of the four short rotator muscles of the shoulder and the inflammatory condition of the overlying serous bursa to which these deposits not infrequently give rise. That others have experienced difficulty in devising an appropriate label for this pathologic entity is well attested by the diversity of captions used by many who have written on the subject in the last two or three decades. It has been described as "periarticular calcifications,"<sup>1</sup> "para-articular calcifications,"<sup>2</sup> "subacromial" or "subdeltoid calcifications,"<sup>3</sup> "humeroscapular" or "scapulohumeral periartthritis,"<sup>4</sup> "para-arthritis,"<sup>5</sup> "Duplay's disease,"<sup>6</sup> "calcified bursitis,"<sup>7</sup> "calcic bursitis,"<sup>8</sup> "calcification of

the subacromial bursa,"<sup>9</sup> "rheumatism" or "neuritis"<sup>10</sup> and "painful shoulder."<sup>11</sup>

The fact remains that calcium deposits in the tendinous cuff which forms the capsule of the shoulder joint have for some time been recognized as a potential source of shoulder pain. The anatomy of this region, the pathologic changes encountered, the composition of the calcium deposits and their relation to the subacromial bursa are now quite well known, chiefly as the result of Codman's work on the shoulder;<sup>12</sup> yet little precise information is available as to the incidence of such deposits in the general population, what factors cause or contribute to their formation and what plan of treatment offers the best prospects of relief and cure of those deposits which give rise to symptoms.

Through observation of a large group of presumably normal persons over a period of years, much interesting and pertinent material on these points has been accumulated.

During the three year period from 1937 through 1939, 6,061 unselected persons were subjected to physical and fluoroscopic examination of both shoulders in connection with a routine examination at the home office of the Metropolitan Life Insurance Company; 5,061 were company employees while 1,000 were applicants for insurance or for employment. Of the whole group 165 (2.7 per cent) were found to have calcium in sufficient amount to show on fluoroscopy in one or both shoulders. The incidence of calcium formation was exactly the same in the employee and the nonemployee groups.

An analysis of both groups on the basis of sex, age and occupation has been made. Since, however, it has been possible to study the 5,061 employees much more intensively and to follow them with reexamination at annual intervals, the remainder of this report will be confined to them unless expressly stated otherwise.

Before employment each applicant is subjected to a thorough physical and laboratory examination, including roentgenograms of the chest. Throughout the period of employment a detailed medical record is kept of serious and minor ailments as well as of annual physical and fluoroscopic examinations of the heart and lungs.

The 5,061 employees were taken in succession as they came for the annual health examination. They include 3,883 females and 1,178 males, of whom 89.4 per cent were under the age of 40. Seventy and nine-tenths per cent did purely or mostly clerical work, 23.2 per cent used either a typewriter or similar manually operated machine exclusively, while the remainder were employed in miscellaneous occupations such as messengers, elevator operators, porters and cleaners.

It is obvious that the group studied constitutes a selected portion of the general population as to physical condition (preemployment and annual examinations), sex (76.7 per cent females), age (89.4 per cent under 40) and occupation (94.1 per cent clerks or typists).

Dr. H. H. Fellows, assistant medical director of the Metropolitan Life Insurance Company, and Drs. R. K. Felter, J. H. Inkster, Elcanor Murphy, Mary E. O'Sullivan and Peter Sabatelle assisted in this study.

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12. Codman, E. A.: *The Shoulder*, Boston, The Author, 1934.



It is in the main a cross section of the so-called white collar class of workers.

In the course of routine annual fluoroscopic examination of these 5,061 employees, visible calcium deposits were found in one or both shoulders of 138 (2.7 per cent).

#### TECHNIC OF EXAMINATION

Since this investigation was based on a search of several thousand supposedly normal shoulders for possible calcium deposits, it is apparent that roentgenography of each shoulder was not only highly unpractical but essentially valueless. Not only would many films have to be taken of each shoulder in different planes but this would have to be repeated each time the person was subsequently examined, and even then some calcium collections would be overlooked.

Good sized deposits may easily be missed unless they are seen in profile. It is quite usual for the calcium to be spread out in a thin layer, which is effectively obscured by the humeral head until the arm is rotated

the formation of calcium deposits. Only percentages based on an adequate number of persons examined in each group are of significance in a comparative study.

*Sex.*—Although the majority of persons with calcium deposit were females, deposits were found with greater relative frequency in males (3.6 per cent) than females (2.5 per cent) in the whole employee group.

*Age.*—Again, despite the fact that 70.3 per cent of all positive results were found in persons under 40, the incidence of calcium deposits in both males and females rose with the advance of years, by decades, up to the age of 50, after which it declined sharply.

*Blood Calcium.*—Blood calcium values were determined for 20 persons of this series, all with large deposits in one or both shoulders. Some were suffering from an acute bursitis; others were not. In every instance normal values were obtained.

*Infection.*—No one has succeeded in linking calcium deposition in these tendons or the associated bursitis to

*Calcium Deposits in the Shoulder: A Survey of 5,061 Home Office Employees of the Metropolitan Life Insurance Company Grouped According to Sex, Age and Occupation*

Age at Examination	Males												Females											
	Total				Clerks				Typists				Miscellaneous				Total				Clerks			
	With Deposits				With Deposits				With Deposits				With Deposits				With Deposits				With Deposits			
	Number Examined	Number	Per Cent		Number Examined	Number	Per Cent		Number Examined	Number	Per Cent		Number Examined	Number	Per Cent		Number Examined	Number	Per Cent		Number Examined	Number	Per Cent	
Total	1,178	42	3.6		954	34	3.6		14	1	7.0		210	2	3.3		3,883	96	2.5		2,636	56	1.0	
17-19	4	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	115	..	..	..	51	..	..	..
20-29	533	7	1.3	..	471	5	1.1	..	12	1	8.3	..	50	1	2.0	..	2,079	40	1.5	..	1,721	14	0.8	..
30-39	408	10	2.5	..	354	10	2.8	..	2	..	..	..	47	..	..	..	794	40	5.0	..	607	24	4.0	..
40-49	138	16	11.6	..	82	13	15.9	..	..	..	..	..	56	3	5.4	..	180	13	7.0	..	137	9	6.6	..
50-59	73	5	6.8	..	33	3	9.1	..	..	..	..	..	40	2	5.0	..	93	3	3.2	..	79	3	3.8	..
60-70	27	4	14.8	..	14	3	21.4	..	..	..	..	..	13	1	7.7	..	16	..	..	..	11	..	..	..

so that the roentgen rays have to traverse not the thickness but the width or length of the deposit (fig. 1). For these reasons fluoroscopy is preferable to roentgenography in detecting the presence of calcium deposits and should never be omitted as a preliminary procedure. Similarly, no deposit should be considered completely absorbed unless the shoulder has been checked by fluoroscopy (fig. 3). Both shoulders should be examined in every case.

My practice has been to examine the shoulder with the fluoroscope throughout its full range of motion and take a spot-film of each deposit as it appears in profile, using a specially devised cassette holder which is hung on the fluoroscopic screen. The details of shoulder examination by a combination of fluoroscopy and spot-film roentgenography are beyond the scope of this paper and will be discussed elsewhere.<sup>12a</sup> Excellent technical descriptions of roentgenography of the shoulder are available in the recent literature.<sup>13</sup>

#### ETIOLOGIC FACTORS

Care must be exercised in drawing conclusions as to the effect of sex, age, occupation and other factors on

a local infectious process (cultures taken at operation have always been negative; operative wounds do not suppurate) or to a past or present systemic infection. The opinion has been expressed that infection plays no part in the formation of calcium;<sup>14</sup> the present investigation confirms this theory.

A careful search of the detailed medical records of all 138 persons showing calcium deposits was made for serious illness, arthritis, rheumatism and foci of infection, but none of these factors appeared to influence the formation or course of these deposits in the slightest degree. One hundred and seven (72 per cent) of the 138 employees with deposits were in the company's employ and subject to close, continuous medical observation for a period of ten years or longer, many of them for more than thirty years; yet of these only 23 had suffered any serious illness, and only 9 had a record of arthritis or rheumatism in any form. Fifty had some focus or foci of infection serious enough to require medical attention, usually of minor degree, at some time during their employment; more than half were tonsils and most of the remainder were sinuses.

*Occupation.*—Since there were very few male typists in this series of cases, a study of the effect of occupation on calcium deposit formation must be confined to females. A glance at the table will show that women typists had a significantly higher incidence of deposits than women clerks throughout all age groups up to the

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14. Wilson, P. D.: Shoulder Pain, *Brit. M. J.* 2:1261-1265 (Dec. 30) 1939. Carnett and Case.<sup>12</sup> Codman.<sup>12</sup> Patterson and Darrach.<sup>14</sup>



age of 50. This seems to provide a positive answer to the question raised by Codman<sup>12</sup> as to the effect of occupation on the formation of deposits, and it substantiates his impression that "Millions of years of heridity have not prepared the modern stenographer or machine operator to keep their supraspinatus tendons stretched and under tension, on the qui vive hour after hour, day after day."

Therefore, while it cannot be proved that any particular job was responsible for a certain calcium deposit, nevertheless occupation as a causative factor must be given due consideration in deciding whether the work in question produced or helped to produce the deposit, when that work involves constant abduction of the arms for months and years.

**Trauma.**—The relation, if any, of trauma to calcium deposits and acute bursitis is one of the most interesting and at the same time most difficult problems presented by this symptom complex. "As these little calcified deposits now cause loss to the insurance companies, they are assuming more importance than when they only bothered the individual patient."<sup>12</sup> Any claim for compensation in this connection immediately raises the questions: Did the alleged trauma produce the lesion or aggravate an existing lesion, or was it merely coincidental?

Of 41<sup>15</sup> shoulders with an acute attack of bursitis in only 7 was there a clearcut history of antecedent trauma which could reasonably be considered as precipitating the acute attack, and most of these traumas were of trivial nature. They are so typical as to be worthy of verbatim report: "while moving bureau to attic," "slipped on stairs and fell," "while gardening on return from vacation," "while scrubbing floor," "while reaching up to fix windshield wiper," "after a fall," "while putting on my coat."

In the remaining 34 acute attacks of bursitis the patient was unaware of any specific trauma or exertion as responsible for the condition. Several patients were

known calcium deposits in one or both shoulders with little or no symptoms for months or years prior to the acute attack.

In this series of cases, therefore, there is no statistical evidence that any single trauma per se was responsible for calcium deposition or for the acute attack of bursitis associated therewith. Trauma, when it did occur, has

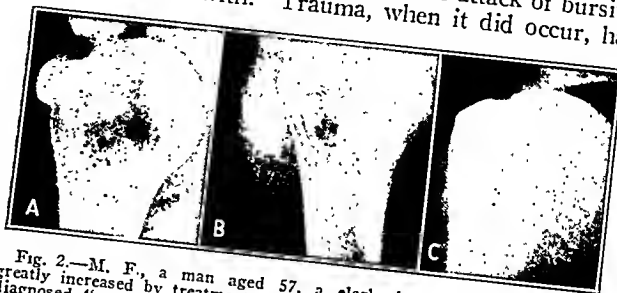


Fig. 2.—M. F., a man aged 57, a clerk, had distention of bursa, greatly increased by treatment with heat. He had had slight symptoms diagnosed "myositis" (no roentgenograms were made) for three years, unrelieved by baking. There was sudden onset of acute bursitis (A). Symptoms were aggravated by three weeks of baking (B). Ultimate complete relief occurred with disappearance of calcium in one year (C).

seemed to be coincidental<sup>16</sup> or at most the straw that broke the camel's back by merely precipitating an inevitable bursitis.

#### LOCATION AND SIZE OF DEPOSITS

Forty-six and four-tenths per cent of the 138 patients with calcium had bilateral deposits, calcium being visible in a total of 202 shoulders. Among those with unilateral deposits, the right shoulder was involved twice as often as the left.

As the tendons of the short rotators, the supraspinatus, infraspinatus, teres minor and subscapularis, are indistinguishably fused to form the capsule of the shoulder joint, it is at first difficult to determine which tendon contains the deposit. Practically, it makes little difference; the important thing is to locate the deposit in profile and note the rotation of the arm which brings it there. With practice and the use of a suitable spot-film roentgen technic, it is possible to attain a fairly high degree of accuracy in this procedure.<sup>12a</sup>

Fifty-one and five-tenths per cent of the involved shoulders had calcium in the supraspinatus portion of the cuff, 44.5 per cent in the infraspinatus and 23.3 per cent in the teres minor. Only 5 shoulders showed calcium in the subscapularis. Calcium was visible in the subacromial bursa in 25 shoulders (figs. 2 and 3). This may seem surprising in view of the fact that there were 41 shoulders with an acute attack of bursitis, yet it confirms a rather common operative finding of milky, calcium-containing fluid in a bursa in an acute state which did not show on roentgen examination.

Variations in roentgen technic, in the contour of the person examined and in the shape of the deposit make classification of calcium formations according to size extremely difficult, yet a grouping of deposits from this standpoint is of considerable value in treatment and prognosis. For the purpose of this report, the following basis of comparison was used:

- Large: Deposits 1.5 cm. or longer in their greatest profile dimension.
- Medium: All others except:
- Tiny: Those barely perceptible on fluoroscopic examination.

According to this classification, 16.3 per cent of the shoulders showing deposits contained one or more large deposits, 54.5 per cent had medium ones and 50 per

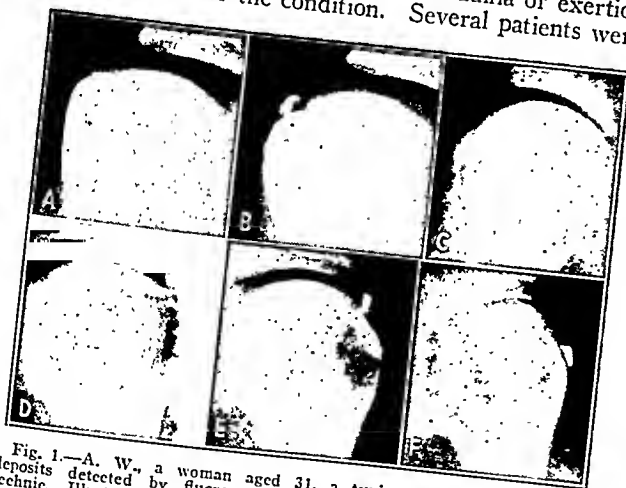


Fig. 1.—A. W., a woman aged 31, a typist, had multiple calcium deposits detected by fluoroscopy and roentgenographed by spot-film technic. Illustrates the importance of fluoroscopic examination, with arm rotation, to bring out deposits hidden by the humeral head. She had had slight symptoms in both shoulders for four years, diagnosed "myositis" (no roentgenograms). A, B, C: Right shoulder; diagnosed "myositis" in external rotation. D, E, F: Left shoulder; external, mid and internal rotation.

merely awakened suddenly during the night, without warning, by acute pain in the shoulder. It should be noted, furthermore, that many of these patients had had

15. Eighteen of these occurred among the 138 employees in whom deposits were found on routine fluoroscopy; 23 occurred among 29 additional employees who were seen initially for relief of their symptoms.

16. Carnett, J. B., and Case, E. A.: Clinical and Pathological Discussion of So-Called Subacromial Bursitis, S. Clin. North America 9: 1107-1126 (Oct.) 1929. Codman.<sup>12</sup>

cent had tiny accumulations. Multiple deposits occurred in 20.3 per cent of the involved shoulders. In a number of cases the joint capsule was studded with bits of calcium as though with buckshot (fig. 1).

#### APPEARANCE AND DISAPPEARANCE OF CALCIUM

The slowly progressive accumulation of calcium and its regression are clearly depicted in a series of roentgenograms taken of one patient during the past eight years. A woman aged 29, a machine operator, had had painful deposits in both shoulders since 1932 (fig. 3). An acute attack of bursitis of the right shoulder in 1934 was partially relieved by baking and diathermy, with regression but not complete disappearance of the deposit. Meanwhile the calcium collection in the left shoulder has grown steadily larger, with progressively increasing symptoms. She manages to perform her work and thus far has consistently refused treatment of the left shoulder, although she has repeatedly been advised to have the calcium removed. In view of the past history of this shoulder it will be of particular interest to observe whether the onset of the acute attack

sized or tiny. Every large deposit gave rise to symptoms before disappearing completely.

#### SYMPTOMS

Seventy (34.6 per cent) of the 202 involved shoulders caused some degree of pain or discomfort at one time or another, either prior to or during the period of observation. This varied from an occasional "twinge" or "hitch" in dressing or in doing the hair to complete disability, with intense pain and muscular spasm. Nocturnal discomfort was most frequently mentioned, consisting of great difficulty in finding a comfortable position in bed at night. Probably this is due in some measure to release of traction which the weight of the arm maintains with the patient upright during the day; with the traction removed, muscle tonus and spasm cause increased pressure on the painful deposit. In addition, of course, it is hard to sleep on one side all night, and there is nothing to divert the patient's attention from the affliction.

The majority of persons affected, on adequate questioning, were able to recall having had "trouble" with the shoulder previously. However, it is surprising how often even severe pain may be forgotten, for complaints were found in the past medical records of 5 persons who stated that they had never suffered.

Twenty-two (10.9 per cent) of the 202 involved shoulders gave rise to symptoms for the first time subsequent to discovery of the calcium on fluoroscopic examination; in 7 of these calcium deposits were observed to have remained without symptoms for from one to two years.

In 5 shoulders symptoms which called attention to visible deposits first developed subsequent to a negative fluoroscopic examination; 2 at two months, 1 at four months, 1 at six months and 1 at about one year after the negative examination.

In order to estimate the severity of symptoms, the 70 painful shoulders have been divided into three groups: acute, mild and slight. Symptoms are notoriously difficult to evaluate. Some persons bear pain well and others do not. However, there is no mistaking an acute attack of bursitis; these are the really "acute." Other shoulders with less pain but sufficient to require treatment are classed as "mild" and those which cause some annoyance but no real pain form the "slight" group.

On this basis, the symptoms in 18 shoulders were acute, in 22 mild and in 30 slight. The size of the deposit in general accorded with the symptoms complained of, yet it is interesting to note that one third of the large deposits gave rise to no complaints whatever while under observation (fig. 4).

#### TREATMENT

The question of what form of treatment offers the best prospects of relief or cure of painful shoulder deposits is a difficult one. This affliction is sometimes self limited and self curative. It is common knowledge that an occasional case may become temporarily improved or even to all intents and purposes cured without treatment. I have seen this happen in 4 shoulders which went untreated and had complete

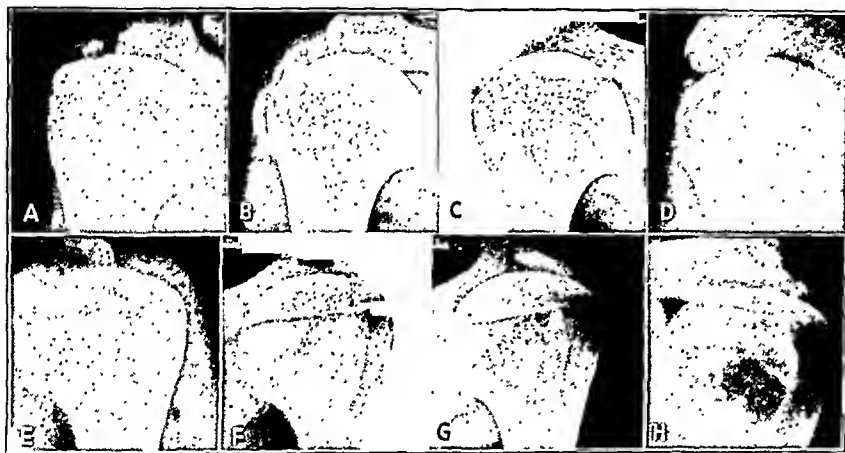


Fig. 3.—F. D., a woman aged 29, a machine operator, had calcium deposits with symptoms in both shoulders for eight years (referred to in text). Right Shoulder: A (1932), two medium size deposits; B (1934), acute bursitis; C (1938), calcium apparently all gone (roentgenograms without fluoroscopic examination); D (1939), calcium residue persists (fluoroscopic examination, with rotation, and spot-film roentgenograms). Left Shoulder: Progressive increase in deposit and symptoms: E, 1932; F, 1935; G, 1938; H, 1939.

of bursitis, which I believe is inevitable, coincides with any trauma.

Calcium appeared subsequent to a negative fluoroscopic examination in 29 (14.4 per cent) of the 202 shoulders showing deposits. All these deposits were seen within one year of the first (negative) fluoroscopic examination, 3 of them being discovered within as short a period as two months. It is conceivable that 1 or 2 of these may have been overlooked at the first examination, before our fluoroscopy technic had been fully developed; certainly the majority were not. Two were large deposits and half the rest were of medium size, easily seen.

Though calcium has often been observed to regress under treatment, and for that matter without treatment, in only 13 shoulders did it entirely disappear within the period of this study. Nine of the 13 presented symptoms. Of these, in 2 there was no treatment of any kind given, in 2 others the deposit was removed by operation and in 5 the deposit disappeared coincidentally with baking or diathermy. In the remaining 4 shoulders in which the calcium disappeared under observation there were never any symptoms nor was any treatment given; all these deposits were medium

spontaneous remission of symptoms. This fact, of course, makes it possible for the proponent of any particular form of treatment to claim cures for his own method. Thus an element of confusion and uncertainty is added to the problem, and one is wise to keep this in mind when analyzing any series of end results.

The present report is no exception. It is admitted that a certain (unknown) number of those patients listed as cured by any one of the modes of treatment which were used might have obtained full relief without treatment. However, as this factor of uncertainty applies equally to all the therapeutic methods under consideration, a comparison of the end results of those methods is still significant.

During the three year period of investigation there were seen 40 shoulders of patients not included in this study in which relief from painful deposits was sought. In estimating results of treatment, these 40 shoulders have been added to the 70 painful shoulders in which the deposits were first found on routine fluoroscopic examination, making a total of 110 painful shoulders which came under observation. Among these 110 shoulders were 33 in which treatment was refused. The other 77 received baking, diathermy, excision or irrigation of deposits, singly or in combination, with ultimate complete relief in half and partial amelioration of symptoms in most of the rest.

A mere statistical summary such as this does not, however, tell the whole story. Many of those patients counted as fully relieved by baking or diathermy or both were under treatment, with pain and disability, off and on for years. As many as sixty to eighty diathermy treatments were given to a single shoulder over a period of six to eight months in at least 2 instances, with little or no relief. Apart from the physical suffering incurred, the expense of treatment and the number of work days lost are factors of considerable importance to these patients and to insurance companies, when the latter are involved.

Frequently an acute attack was precipitated or a somewhat painful shoulder made worse by the application of heat (fig. 2). On the other hand there are occasional patients who have been completely relieved by a few baking or diathermy treatments; these I believe are ones which would have had spontaneous remission of symptoms regardless of treatment. In most cases there has been temporary or partial relief following conservative measures, with subsequent recurrent attacks in the same shoulder.

Although no conclusion as to the relative merits of these different modes of treatment can as yet be supported by statistics, owing to the small number of treated shoulders available, I have acquired certain convictions regarding treatment as a result both of this study and of experience in practice.

I agree with those<sup>17</sup> who feel that the best treatment for the acute attack is prompt excision of the deposit.

17. Bartels, W. P.: Surgical Treatment of Acute Subacromial Bursitis, *J. Bone & Joint Surg.* 22: 120-121 (Jan.) 1940. Hitzrot, J. M.: Surgical Diseases of Bursae, *Ann. Surg.* 98: 273-282 (Aug.) 1933. Weiland, A. H., and Burbacher, C. R.: Bursitis, *South. Surgeon* 9: 26-33 (Jan.) 1940. Carnett and Case.<sup>18</sup> Codman.<sup>12</sup> Haggart and Allen.<sup>11</sup> Wilson.<sup>14</sup>

In experienced hands it is a relatively minor procedure, done under local or general anesthesia through a small incision. It gives immediate, certain and complete relief which so far as I know has been permanent. The patients have had an average hospital stay of four days and have been able to resume their usual duties, with unrestricted shoulder motion, in three weeks.

I recognize the fact that irrigation<sup>18</sup> will give relief in selected cases of acute involvement in which the bursa is well distended and free of adhesions, but it too is an operative procedure (less certain than excision of the deposit), to be done under anesthesia in a hospital, and I am not convinced that all the calcium, from tendon as well as from bursa, can be removed in this way in every case.

The application of heat by one modality or another<sup>19</sup> is therapeutically sound, but as an adjuvant rather than as a primary or basic form of treatment. I use it following operation to speed healing and recovery.

Not one of the painful shoulders in this series was subjected to roentgen therapy.<sup>20</sup>

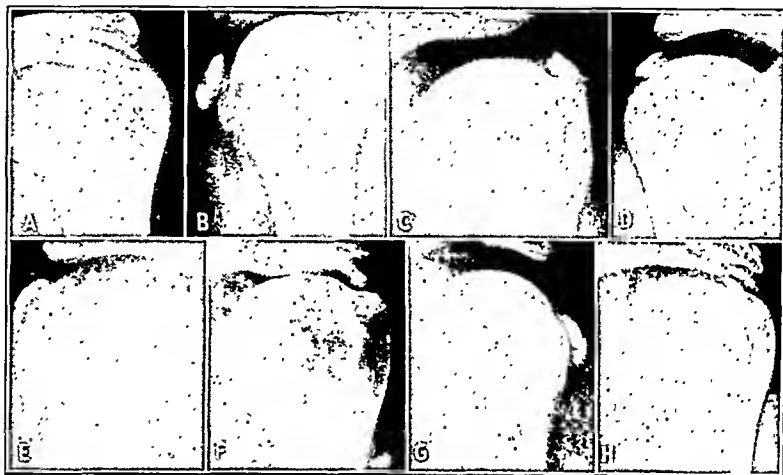


Fig. 4.—Some large calcium deposits, thus far without symptoms, found on routine fluoroscopic examination: A, R. M., ♀, 35, typist. B, V. S., ♀, cleaner. C, K. D., ♀, 45, clerk. D, I. R., ♀, 46, clerk. E, P. T., ♂, machine operator. F, E. B., ♀, 42 clerk. G, H. T., ♀, typist. H, R. K., ♂, 40, clerk. Since this was written patient P. T. had a sudden acute attack of bursitis of the same shoulder and was operated on, with immediate complete relief.

Immobilization of the shoulder, whether by swathe or by plaster encasement, is mentioned only to be condemned, because of the real danger of the formation of adhesions.

My practice has been to explain to each patient as simply as possible the underlying anatomy and pathologic condition and what my experience has been with the various modes of treatment. Choice of therapy is then left largely to the patient. The result has been that only a few patients ask for immediate operative relief. The majority decide to try heat applications, baking, diathermy or short wave. Some obtain complete relief after more or less prolonged treatment, but in most cases the relief is temporary or partial, with

18. Patterson, R. L., Jr., and Darrach, William: Treatment of Acute Bursitis (Subdeltoid) by Needle Irrigation, *J. Bone & Joint Surg.* 19: 993-1002 (Oct.) 1937.

19. Dickson, J. A., and Crosby, E. H.: Periarthritis: Analysis of Two Hundred Cases, *J. A. M. A.* 99: 2252-2257 (Dec. 31) 1932. Mumford and Martin.<sup>7</sup>

20. Lattman, Isidore: Treatment of Subacromial Bursitis by Roentgen Irradiation, *Am. J. Roentgenol.* 36: 55-60 (July) 1936. Loenneken, R. Roentgenotherapy of Humero-Scapular Peritendinitis, *Med. rev. Bergen* 10: 499-507 (Nov.) 1932. Segre, M.: Roentgenotherapy of Calcareous Scapulo-Humeral Periarthritis, *Radiol. méd.* 27: 522-539 (July) 1936 de Lormier.<sup>8</sup> Mustakallio.<sup>4</sup>

recurring attacks over a period of years. Six patients have returned for excision of the deposit.

While I feel that large deposits should be excised regardless of symptoms, to forestall the development of an acute attack of bursitis, no patient has yet been willing to have this done. Medium and tiny deposits should, in general, be treated conservatively and should be watched.

#### SUMMARY AND CONCLUSIONS

Among 6,061 supposedly normal persons of the white collar class, calcium was found on routine fluoroscopic examination in one or both shoulders of 165 (2.7 per cent). Of this series 5,061 were studied at annual intervals over a three year period and provide the material from which the following conclusions are drawn:

1. Fluoroscopy and spot-film roentgenography are invaluable aids in the detection and precise localization of calcium deposits in the shoulder.

2. Calcium deposits occur most commonly during the period of greatest activity of adult life, and especially among males.

3. Serious illness, arthritis, rheumatism and infection, whether local or systemic, past or present, exert no influence on the formation or regression of deposits.

4. Occupations that require constant prolonged abduction of the arms foster the formation of calcium deposits in the shoulder.

5. A single trauma per se does not cause calcium deposition, although it is occasionally associated with the onset of an inevitable bursitis.

6. Although fluoroscopically visible calcium deposits may form within as short a period as two months, most deposits require a considerably longer time for their formation.

7. Medium and tiny deposits may disappear without symptoms, but large deposits always result in a painful shoulder sooner or later, though they may remain quiescent and symptomless for months or years.

8. Excision of the deposit is recommended as the best treatment for the acute attack, since it offers immediate, certain, complete and permanent relief.

1045 Park Avenue.

**A Liberal Profession.**—Medicine today is probably the most liberal of all the professions of society. It recognizes addition to its knowledge from any source, and the present edifice of scientific medicine has been reared on the labor and contributions of innumerable physicians, scientists and lay people, regardless of race, color or creed. Medicine is the most international of sciences and therefore least nationalistic. It comprises a democracy of intelligence, knowing neither geographic nor racial bounds. Medicine has no bench or bar; the lawyer must pay deference to the judge, who intellectually may be his inferior; neither has medicine a hierarchy as in the case of the ecclesiastical profession. In medicine all men are alike; there are no castes, no orders, no class distinctions. Its devotees meet on common ground in practice, in research, in hospitals, in schools and in conventions, where eager minds come together for mutual improvement and understanding. . . . Medical science has done much to make possible the state of society as it exists today.—Abell, Irvin: *The Spirit of Medicine, Pharos of Alpha Omega Alpha*, May 1941.

## CENTRAL NERVOUS SYSTEM MANIFESTATIONS OF INFECTIOUS MONONUCLEOSIS

REPORT OF A CASE

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AND

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Involvement of the central nervous system in infectious mononucleosis is rare, but probably not as rare as the dozen or so cases thus far reported would seem to indicate. What is more likely is that the nervous system involvement so masks the other manifestations of the disease that the diagnosis is overlooked.<sup>1</sup> The nervous symptoms may appear as much as two weeks before the characteristic lymphadenopathy and splenic enlargement<sup>2</sup> resulting, if the characteristic blood picture is overlooked, in the erroneous diagnosis of lymphocytic choriomeningitis, acute toxic encephalitis, epidemic encephalitis or early poliomyelitis.

The neurologic symptoms produced may be multiple. All patients have headaches. There is a varying degree of dulling of the sensorium from mild lethargy to coma. The patient may be irritable and irrational.<sup>1</sup> There may be photophobia, nystagmus and poor articulation.<sup>3</sup> Peripheral neurologic symptoms, such as facial nerve palsy, oculomotor nerve involvement, optic neuritis and anosmia, are occasionally present. Signs of meningeal irritation are usually present with positive Kernig and Brudzinski signs, nausea and vomiting.

The spinal fluid has been examined in only a few cases, and the conditions found are neither characteristic nor constant. The pressure may or may not be moderately elevated. Pleocytosis is variable, usually from 25 to 300 cells, largely lymphocytes. On one occasion a cell count over 1,000 was reported.<sup>4</sup> In our case the cell count at the height of the disease was normal. The total protein may be increased, as may the globulin fraction. The spinal fluid Wassermann reaction and colloidal gold curves are negative. Schmidt and Nyfeldt<sup>5</sup> and Huber<sup>4</sup> found abnormal spinal fluids in several cases of infectious mononucleosis in the absence of any nervous system symptoms or signs. Schmidt and Nyfeldt<sup>5</sup> were also able to obtain cultures of *Listerella* from the spinal fluid in 4 of 5 cases. Cerebral symptoms were present in only 1 of these cases.

Characteristically the nervous system symptoms and signs disappear, with no residuum. The spinal fluid returns to normal some time after the symptoms and signs disappear.<sup>1</sup>

#### REPORT OF CASE

B. S., a white man aged 21, was admitted to the Michael Reese Hospital on May 19, 1940 complaining of severe headache, dizziness, vomiting and a staggering gait of one week's duration.

From the Michael Reese Hospital.

1. Epstein, S. H., and Dameshek, William: Involvement of the Central Nervous System in a Case of Glandular Fever, *New England J. Med.* 205: 1238, 1931.

2. Gsell, O.: Serous Meningitis in Pfeiffer's Glandular Fever (Infectious Mononucleosis), *Deutsche med. Wchnschr.* 63: 1759, 1937.

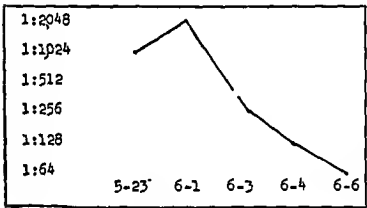
3. Marshall, E. A.: Infectious Mononucleosis, *Am. J. Clin. Path.* 9: 298, 1939.

4. Huber, W.: Serous Meningitis in Pfeiffer's Glandular Fever, *Schweiz. med. Wchnschr.* 68: 892, 1938.

5. Schmidt, V., and Nyfeldt, A.: Regarding Infectious Mononucleosis and Meningoencephalitis, *Acta oto-laryng.* 26: 680, 1938.

He was well until approximately ten days before admission, when he had severe pain in his calf muscles lasting one day. On the following day the pain subsided, but dizziness and headache began, which gradually became more severe, especially while he was in the erect position. His gait became very unsteady. Frequent attacks of nausea and vomiting followed. Five days before he entered the hospital these symptoms became so severe that he was obliged to stay in bed. The patient was very irritable at first but later became more and more lethargic, and at times responded irrationally. He complained bitterly of the headaches, which were retro-orbital and frontal. His temperature during the week prior to admission rose to 101 F. during the evening but fell to 99 in the morning. There was no history of a sore throat, cold or cough in the recent past. The past history and family history were noncontributory. He was employed in a fruit commission house where only California fruit was handled. There was no history of insect or animal bite or of head injury.

On physical examination the patient appeared well nourished and lay quietly in bed, exhibiting but little interest in his surroundings. The temperature was 100 F. and the pulse rate 100 per minute. The skin showed no petechiae, ecchymoses or eruptions. It was warm, and perspiration was profuse. The conjunctivas showed no petechiae or icterus. The extraocular muscles were normal. There was no nystagmus. The pupils reacted normally to light and in accommodation, were equal in size and were regular. The fundi were normal. The tongue was heavily coated and dry. There were several carious teeth. The mucous membrane of the pharynx was not injected. The tonsils were absent. There was no cervical adenopathy. The lungs and heart were normal. The abdomen was soft and not tender. No masses were palpable. The spleen, liver and kidneys were not palpable. There was no cyanosis or edema of the extremities or axillary, epitrochlear or inguinal lymphadenopathy.



Blood heterophile agglutination titer.

Neurologic examination revealed a freely movable head and no neck rigidity. The head was not tender on percussion. The eyes were normal. Likewise the other cranial nerves were intact. The speech was poorly articulated; the words were slurred, somewhat explosive in character and often hardly understandable. Reading aloud exaggerated these peculiarities. The ability to see the printed words did not seem impaired. Muscular movement, tone and strength were normal. However, the muscular coordination was very poor. In the finger-to-nose test the nose was missed consistently, and the movement was not smooth but was broken up into several stages. In the heel-to-knee test the heel was brought to the knee fairly accurately, but when the patient was directed to leave it there or to slide the heel downward along the tibial crest the foot shook violently, and there was extreme unsteadiness and deviation. Standing was possible only with the legs spread widely apart, and even then there was pronounced swaying. When the feet were brought together the patient tended to fall backward. Walking was extremely unsteady and almost impossible. Sensation was normal for touch, pinprick, movements and vibration. Reflexes were normal except for a more vigorous radial jerk, absent left cremasteric and absent cutaneous abdominal reflexes. The knee jerks and ankle jerks were normal. The Babinski reflex was absent.

The patient was slow in understanding and almost stuporous. Occasionally one had to speak to him loudly to maintain his attention. He attempted to cooperate but followed directions very poorly. His answers were very slow in forthcoming, but fairly reasonable. When the patient's extremities were placed in the most uncomfortable positions, he tended to maintain that position in almost catatonic manner. His face was devoid of expression.

The impression at this time was that we were dealing with an encephalomyelitis secondary to some unknown systemic infection. The patient's symptoms remained unchanged on May 20 and 21 but began to improve on the 22d and continued improving until his discharge. The high mononuclear count (50 per cent) present on the day following admission provoked comment, but it was not until the laboratory reported a blood heterophile

TABLE 1.—Blood Counts

	5/19	5/20	5/23	5/25	5/29	5/31	6/2	6/3	6/4	6/6
Erythrocytes.....	..	5.98	..	5.1	..	..	5.3	..	..	..
Hemoglobin, %...	..	80-90	..	80	..	80-90	93(S)	..	..	..
Leukocytes.....	13,600	11,400	13,800	14,000	11,500	11,150	10,400	10,100	8,300	8,100
Neutrophils, %...	..	50	..	12	..	23	19	22	35	51
Lymphocytes, %...	..	39	..	88	..	66	71	60	52	44
Large lymphocytes.....	..	..	..	28	..	..	40	27	..	12
Small lymphocytes.....	..	..	..	60	..	..	31	42	..	32
Monocytes.....	..	11	..	..	..	11	10	9	9	4
Wassermann reaction.....	..	Neg.	..	Neg.	..	..	Neg.	Neg.	Neg.	Neg.
Kahn reaction....	..	Neg.	..	Neg.	..	..	Neg.	Neg.	Neg.	Neg.

agglutination titer of 1:1,024 that its significance became clear. Reexamination of that blood film and all subsequent blood films demonstrated the typical blood picture of infectious mononucleosis (table 1). There was a high lymphocyte percentage. The lymphocytes showed much variation in size. The nuclei were darkly stained and contained many vacuoles. There was a shift to the left among the granulocytes, with many unsegmented cells. There were also many disintegrating and degenerate neutrophils. The frequently repeated blood studies (table 1) show the gradual decrease in monocytes and large lymphocytes as recovery progressed. A stool passed on the 20th was reported having 3 plus occult blood. For this reason bleeding, coagulation and prothrombin times were determined and found normal (1 minute 10 seconds, 3 minutes five seconds and 30 seconds respectively). The platelet count was 220,000 per cubic millimeter.

It is interesting that careful reexamination each day after the nature of the illness was recognized failed to reveal enlarged lymph nodes until May 31 (twelve days after the patient entered the hospital and twenty-two days after the onset of symptoms), when several large glands were found in the neck and a chain of large glands appeared in both inguinal regions. Later the axillary nodes became enlarged. On June 3, twenty-five days

TABLE 2.—Spinal Fluid

	5/20	6/1	6/8
Culture.....	Negative	Negative	Negative
Cells.....	5 lymphocytes	9 lymphocytes	1 lymphocyte
Pandy.....	+	+	Ft. tr.
Ross-Jones.....	+	+	Ft. tr.
Total protein, mg. per 100 cc.....	156	170	77
Dextrose, mg. %.....	46	45	41
Wassermann.....	Negative	Negative	Negative
Colloidal gold.....	Negative	Negative	Negative
Heterophile.....	..	Negative	Negative
Pressure, mm.....	175	152	165

after the onset of the illness, the spleen became palpable on deep inspiration.

Table 2 shows the spinal fluid findings. Fluid drawn the day following admission was found to have a normal cell content with a considerable increase in the total protein content and the globulin fraction. Fluid drawn on June 1, after almost all the neurologic abnormalities had disappeared, showed almost the same high protein level and a slightly elevated count. Fluid drawn on June 6, the day before the patient was discharged and after he had been symptom free for more than a week,



showed a greatly reduced but still elevated protein content. The Pandy and Ross-Jones tests were only slightly positive. The cell count was normal.

We have read no reports of spinal fluid examination for heterophile agglutinins in infectious mononucleosis. Serial dilutions beginning with 1:4 concentrations revealed no such agglutinins in our case. Blood and spinal fluid cultures remained sterile.

The chart shows the rapid fall in blood heterophile agglutinins during recovery to an almost insignificant degree just prior to the patient's discharge from the hospital.

Agglutination tests of the patient's serum against *Listerella monocytogenes* were negative. Throat cultures made on the day of admission showed only alpha streptococci. The urine was constantly normal.

#### COMMENT

This case is almost unique among the cases of infectious mononucleosis which showed involvement of the central nervous system, in that there were no signs and almost no cerebrospinal abnormalities (except for 9 cells in one count) pointing to meningeal involvement. Especially striking was the cell protein dissociation in favor of the protein, which speaks against involvement of the meninges. In the majority of the cases reported there was meningeal involvement with a considerable increase in cell content, at least during one phase of the disease, while the protein showed hardly any increase.

Only one case has been reported<sup>6</sup> in which the symptoms (paresis of the left inferior rectus muscle of the eye, highly exaggerated knee jerks, a questionable plantar reflex and entirely normal cerebrospinal fluid) pointed to a purely encephalitic process.

In our case the cerebral involvement was much more extensive. The clinical picture was that of an acute ataxia with outspoken involvement of the cerebellar system.

This is not the place to discuss at any length the question of the localization of the acute ataxia, whether it is produced by the toxic-infectious process of the coordination system (Davidenkoff) or by a circumscribed focus in the hypothalamic region (Margulis). It seems, however, that the pathologic process, whether it is a real "encephalitis," i. e. an inflammatory process, or a "toxic encephalopathy," extends over a rather large area of the brain. In our opinion there cannot be any doubt about the involvement of the cerebellar system. On the other hand there were a number of signs (expressionless face, lack of motor impulse, peculiar kind of somnolence, diffuse perspiration) which make one think of a pathologic process in the gray matter surrounding the third ventricle, the hypothalamic region, so that the possibility of a lethargic encephalitis was considered for a short time.

It is interesting that the lymphadenopathy and palpable spleen, the usual and characteristic signs of infectious mononucleosis, did not appear until the alarming cerebral symptoms were almost gone. We must admit that the diagnosis would have probably been missed except for the laboratory report of positive blood heterophile agglutination, and the case would have been relegated to that wholly unsatisfactory waste-basket category of "aseptic" or "toxic encephalitis." We feel, therefore, that in the presence of acute cerebral symptoms of unknown etiology the heterophile agglutination test should be made.

Several workers have reported isolating *Listerella* in infectious mononucleosis. Schmidt and Nyfeldt were able to obtain cultures of the organism from the spinal

fluid in 4 of 5 cases of the disease, in only 1 of which were cerebral symptoms present. In our case three attempts at obtaining cultures of the organism were unsuccessful.

The spinal fluid in our case was negative for heterophile agglutinins.

#### SUMMARY

1. In a case of infectious mononucleosis the only early symptoms simulated those of encephalitis.

2. The heterophile agglutination determination is of value in cases in which acute cerebral symptoms of unknown etiology are present.

#### TREATMENT OF PARALYSIS AGITANS WITH VITAMIN B<sub>6</sub> (PYRIDOXINE HYDROCHLORIDE)

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Pyridoxine hydrochloride, or the vitamin B<sub>6</sub> fraction of the vitamin B complex, was first discovered by György<sup>1</sup> in 1935 and was first prepared synthetically in 1939 by Harris and Folkers.<sup>2</sup> It consists of 2-methyl-3 hydroxy-4, 5-dihydroxy-methyl-pyridine. It was first used clinically by Antopol and Schotland<sup>3</sup> with beneficial results in 6 patients with pseudohypertrophic muscular dystrophy. These authors expressed the belief that the drug, through its pyridine structure, was involved in the enzyme system concerned in muscular metabolism. Jolliffe,<sup>4</sup> believing muscular metabolism to be involved in paralysis agitans, tested the drug in this condition. He reported its use in 15 patients with paralysis agitans, all of whom had severe involvement. All patients received 50 to 100 mg. of pyridoxine hydrochloride intravenously. Four of the 15 patients showed definite objective improvement. The best results occurred in the idiopathic or arteriosclerotic type of the disease.

Since a considerable proportion of the patients visiting the Outpatient Clinic of the University of Minnesota Hospitals suffer from paralysis agitans, the staff naturally was most anxious to obtain and try any new therapeutic agent that might offer possible aid to these unfortunate persons. A group of 15 patients suffering from paralysis agitans were, therefore, selected for intravenous therapy with pyridoxine hydrochloride.

The type of patient, the amount of treatment and the results of the therapy are shown in the accompanying table. Nine obtained only two weeks of treatment at daily intervals; 6 of these received only 50 mg. of pyridoxine hydrochloride; 2 received 50 mg. for one week and 100 mg. during the second week, while 1 received 100 mg. for two weeks, supplemented by 54 grains (3.5 Gm.) of brewers' yeast. Three patients showed definite objective improvement (in cases 1, 10 and 12). Of these, 1 had idiopathic parkinsonism and 1 had postencephalitic involvement, while the condition

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The vitamin B<sub>6</sub> used in these studies was hexabion hydrochloride, furnished by Merck & Co., Inc.

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of the third patient, although she offered no history of any previous illness, suggested postencephalitis, since the age at onset was 39.

Six patients received daily intravenous treatment with pyridoxine hydrochloride for three or more weeks. This treatment was supplemented with the whole vitamin B complex in the form of 54 grains daily of brewers' yeast. In 5 of these patients the illness was idiopathic, while in 1 it was postencephalitic. Three patients, all of whom had idiopathic parkinsonism, showed definite objective improvement. Neither the age of the patient nor the duration of symptoms seemed to have any effect on the treatment. Good results were obtained in persons whose illness had been present for as long as fifteen years, while often no improvement occurred in some whose illness was fairly recent. The most favorable results appeared in the idiopathic type of the disease. This is in agreement with the results reported by Jolliffe.<sup>4</sup> The nature of the improvement varied from patient to patient. In some it consisted of a drastic reduction in the severity of the tremor; in others the tremor was only slightly affected while the rigidity improved, allowing the patient more freedom in movement. All the patients benefiting from the drug reported a definite subjective improvement, consisting of a decreased fatigability, better sleeping and increased appetite. One patient had gross choreiform movements rather than a parkinsonian syndrome. Since the involvement probably was arteriosclerotic and also extrapyramidal, it seemed of interest to attempt therapy with pyridoxine hydrochloride. Her improvement was most striking, suggesting the possibility that this type of therapy may be of benefit in other types of extrapyramidal involvement. A brief report of those patients responding to this therapy will aid in evaluating the results.

#### REPORT OF CASES

**CASE 1.**—E. C., a woman aged 67, first noticed a definite tremor and rigidity of her hands in 1935. The involvement gradually spread to almost all the muscles of her body, including the muscles of the trunk, producing at first a shuffling gait and mild postural changes and finally an almost complete invalidism, the patient ultimately being confined to a wheel chair. She became weak and for years was able to sit up only for short periods. She had difficulty in sitting up in a car during even a short ride. She had been treated with scopolamine hydrobromide but showed no response to this type of therapy.

Neurologic examination revealed a moderate tremor and extreme rigidity of all limbs. There was complete loss of facial expression and an absence of blinking. The patient was unable to walk or stand without aid. The deep reflexes were reduced but equal. The rest of the examination gave negative results.

She was given daily intravenous injections of 50 mg. of pyridoxine hydrochloride for one week and 100 mg. for the second week. Improvement became apparent after three weeks. Expression rapidly returned to the patient's face. Her tremor became reduced and at times would be completely absent, even under emotional excitement. The rigidity also diminished, so that the patient was soon able to sit up for long periods of time and was also able to walk about the house unassisted. Long rides and even the entertaining of company no longer fatigued the patient.

She has continued to maintain her improvement in spite of two severe gastrointestinal upsets.

**CASE 6.**—L. S., a man aged 47, a jeweler, in 1935 first became aware of an impairment in speech associated with a generalized bodily weakness. He described this weakness as a general slowing down of all his activities, primarily because of difficulty in using his muscles. Impairment in speech consisted in difficulty in getting words out and a general running together of his words as they came out. The muscular rigidity became more severe, retarding all his voluntary movements. Because

of this difficulty he soon became unable to carry on his work as a jeweler. His writing became impaired and his facies expressionless. Continuation of his illness finally resulted in the patient's complete inability to do any type of work.

The neurologic examination revealed a dysarthria and dysphonia associated with a masklike facies and a generalized muscular rigidity. Tremor was not present. Laboratory tests all gave negative results. The patient was placed on varying doses of scopolamine hydrobromide, which he continued to take for a period of months with no improvement. He was then given two courses of pyridoxine hydrochloride intravenously, separated by a two week interval. The first consisted of 50 mg. of the drug daily for a period of two weeks, the second of 50 mg. daily for one week followed by 100 mg. doses the second week. He was simultaneously given 54 grains of brewers' yeast daily. After the second week of his first course of treatment, the patient began to notice definite improvement in his speech. His voice lost part of its monotonous character and there was a definite ability to phonate better. After three weeks of treatment, his facial expressions became livelier. Improvement continued. The muscular rigidity became so reduced that the patient was able to play ball and perform much of the work which he had been forced to discontinue prior to his treatment. At present he is taking 20 mg. weekly of pyridoxine hydrochloride given orally and has maintained his striking improvement.

**CASE 7.**—A. G., a man aged 54, first noticed a slight stiffness in his left arm and leg in 1927. This rigidity gradually increased, producing a definite difficulty in gait. Three months after the onset of rigidity a coarse tremor appeared in the left hand and soon extended to the entire extremity but has always remained more or less localized to the left upper extremity. One year later there appeared an involvement of the facial muscles and a slight disturbance in speech. There was no history of any severe infectious process antedating the onset of his present illness.

Neurologic examination revealed a slight masking of the facies and a moderate sialorrhea. There was rigidity involving all extremities, being most noticeable on the left side, with a tremor limited to the left upper extremity. The patient had difficulty in performing both fine and gross movements with his hands. Scopolamine hydrobromide, which he had taken for a number of years, had produced but little improvement. During the past eight or nine years of his illness his condition had been more or less stationary.

He was given daily intravenous injections of pyridoxine hydrochloride, receiving a total of four weeks of treatment with 100 mg. of the medication. At the same time he was given 54 grains of brewers' yeast daily by mouth. After the completion of his treatment, the patient noticed a definite decrease in the tremor of his left upper extremity. His rigidity became reduced, and his impairment in speech completely disappeared. Whereas before the patient was able to walk for only short distances without becoming tired, he could now walk with ease for many blocks. He was given 40 mg. of pyridoxine hydrochloride by mouth weekly and in three months showed no recurrence of the involvement.

**CASE 10.**—C. S., a woman aged 54, first noticed a tightness of her legs in 1925. One year later there developed a mild tremor of her right hand associated with definite rigidity. This involvement remained localized to the lower limbs until 1938, at which time it spread rapidly to the other extremities. The progress of the illness had been rapid during the past few years, resulting in a slow and shuffling gait and a severe and annoying tremor in her arms. She had continued to walk and travel about unassisted, although she had refused to go out in company because of her condition. More recently a moderate sialorrhea and some scanning of her speech developed. The patient gave no history suggesting any previous involvement of the central nervous system, although her age at onset certainly was suggestive of a postencephalitic involvement.

Examination revealed the characteristic parkinsonian syndrome. The facies was expressionless, and blinking was infrequent. The impairment in speech was noticeable. There was considerable rigidity of all extremities, associated with a rapid,

shuffling gait. A severe tremor was present in the upper limbs and there were beginning contractures of the hands.

She was given a single course of daily intravenous injections of 50 mg. of pyridoxine hydrochloride the first week and 100 mg. the second week. Along with this medication she received 54 grains of brewers' yeast by mouth. After this

was a general slowing up of all her activities, and her gait became shuffling. She found it impossible to do her housework or to carry out her regular activities. At the time of her examination she presented a masklike facies, a staring gaze and a severe tremor and rigidity of all the extremities. She had a definite shuffling gait, walking with small steps and

### Summary of Drug Therapy

Case No.	Patient	Age	Sex	Type of Paralysis Agitans	Duration of Disease, Years	Severity of Disease	Result of Treatment	Duration of Treatment, Weeks	Type of Medication	Daily Dosage
A. Pyridoxine Hydrochloride Given Intravenously										
1	E. C.	67	♀	Idiopathic	5	Severe	Definitely improved	2	Pyridoxine hydrochloride	50 mg. 1 week 100 mg. 1 week
2	G. F.	65	♂	Idiopathic	2	Moderate	Unimproved	2	Pyridoxine hydrochloride	50 mg.
3	O. M. J.	65	♂	Idiopathic	8	Severe	Unimproved	2	Pyridoxine hydrochloride	50 mg.
4	V. G.	59	♂	Idiopathic	5	Moderate	Unimproved	2	Pyridoxine hydrochloride	50 mg.
5	L. B.	59	♀	Idiopathic	15	Severe	Unimproved	3	Pyridoxine hydrochloride Brewers' yeast	100 mg. 54 grains
6	L. S.	47	♂	Idiopathic	5	Moderate	Definitely improved	4	Pyridoxine hydrochloride Brewers' yeast	50 mg. 3 weeks 100 mg. 1 week 54 grains
7	A. G.	54	♂	Idiopathic	13	Moderate	Moderately improved	4	Pyridoxine hydrochloride Brewers' yeast	100 mg. 54 grains
8	F. Z.	63	♂	Idiopathic	11	Severe	Unimproved	4	Pyridoxine hydrochloride Brewers' yeast	50 mg. 3 weeks 100 mg. 1 week 54 grains
9	I. M.	71	♀	Senile chorea	4	Severe	Definitely improved	3	Pyridoxine hydrochloride Brewers' yeast	50 mg. 1 week 100 mg. 2 weeks 54 grains
10	O. S.	54	♀	?	15	Moderate	Moderately improved	2	Pyridoxine hydrochloride Brewers' yeast	50 mg. 1 week 100 mg. 1 week 54 grains
11	M. F.	53	♀	?	16	Moderate	Unimproved	2	Pyridoxine hydrochloride Brewers' yeast	100 mg. 54 grains
12	G. F.	39	♂	Postencephalitic	4	Moderate	Moderately improved	2	Pyridoxine hydrochloride	50 mg.
13	B. H.	38	♂	Postencephalitic	6	Moderate	Unimproved	2	Pyridoxine hydrochloride	50 mg.
14	G. A.	49	♂	Postencephalitic	18	Severe	Unimproved	3	Pyridoxine hydrochloride Brewers' yeast	50 mg. 1 week 100 mg. 2 weeks 54 grains
15	L. B.	35	♀	Syphilitic	4	Severe	Unimproved	2	Pyridoxine hydrochloride Brewers' yeast	50 mg. 54 grains
B. Pyridoxine Hydrochloride Given Orally										
16	A. C.	69	♂	Idiopathic	3	Severe	Definite subjective improvement; mild objective improvement	3	Pyridoxine hydrochloride Brewers' yeast	50 mg. 54 grains
17	J. C.	60	♂	Idiopathic	2½	Moderate	Subjective improvement only	3	Pyridoxine hydrochloride	50 mg.
18	J. V.	62	♂	Idiopathic	10	Severe	Unimproved	3	Pyridoxine hydrochloride Brewers' yeast	50 mg. 54 grains
19	A. J.	63	♂	Idiopathic	3	Moderate	Unimproved	3	Pyridoxine hydrochloride Brewers' yeast	50 mg. 54 grains

course of treatment she was given 40 mg. of pyridoxine hydrochloride by mouth weekly.

Improvement began a few weeks after her treatment. The tremor immediately subsided almost to the vanishing point. Her rigidity improved so that she was able to get around much better. Her improvement has been maintained on the oral medication.

CASE 12.—G. F., a woman aged 39, first noticed her illness in 1936, at which time she suffered a mild tremor of the upper extremities. About six months after the onset of the tremor there appeared a definite rigidity of the upper extremities, a noticeable disturbance in speech and severe sialorrhea. There

finding difficulty in raising her extremities. She had been taking seopolamine hydrobromide, amphetamine sulfate and various other types of medication over a period of years, with little alleviation of her symptoms.

She was given daily intravenous injections of 50 mg. of pyridoxine hydrochloride, receiving treatment for two weeks. At the time of the completion of her treatment she showed no definite objective improvement. She was followed for a period of two months. Six weeks after the completion of treatment she began to improve. Her rigidity decreased to the extent that she was able to do her own housework and move about much better. The sialorrhea decreased remarkably, and her

tremor became almost imperceptible. She still has slight difficulty in speech, although this has also improved.

CASE 9.—I. M., a housewife aged 71, had been afflicted for the past twelve years with gross, bizarre, purposeless, involuntary movements which began first in the arms and later spread to the rest of her musculature. For the past three years this involvement had totally incapacitated the patient. Walking had been almost impossible, and she had been unable to care for or feed herself. The patient's mother had been similarly afflicted but not to the degree to which the patient was involved. The patient has one brother, aged 67, who has noted similar mild twitchings during the past few years. The other five siblings are unaffected. She has three daughters who are at present unaffected. The physical examination, aside from the normal evidences of senescence, revealed no abnormalities. The neurologic examination revealed continuous involuntary, irregular movements involving the upper portion of the patient's trunk, arms and head. These choreiform movements also involved, but to a much less extent, the lower extremities, so that walking was difficult and her gait slightly bizarre. Laboratory studies all gave negative results. Fluoroscopic examination of the chest and a 6 foot roentgenogram of the heart gave negative results. The diagnosis in this case was senile chorea.

The patient was given  $\frac{1}{2}$  teaspoon (2 cc.) of a concentrated yeast (Anheuser-Busch) twice a day and pyridoxine hydrochloride intravenously daily in 50 mg. doses. The pyridoxine hydrochloride was increased to 100 mg. after the second week. These medications were discontinued after three weeks, and the patient was given 40 mg. of pyridoxine hydrochloride by mouth weekly. After the first few injections of the drug her condition showed improvement, which continued during the treatment. After three weeks the patient was walking unassisted and with ease, and her gait showed no observable abnormality. She was now able to write her own name. She could feed herself, but only with considerable difficulty. The choreiform movements were greatly reduced, and the patient could now sit quietly in a chair, whereas previously she had presented rather a bizarre picture. Subjectively the patient felt stronger. This manifested itself in an improved appetite and more restful sleeping.

#### COMMENT

Fifteen patients suffering from paralysis agitans were treated intravenously with pyridoxine hydrochloride, supplemented in most cases by the oral administration of brewers' yeast. The patients received 50 to 100 mg. of the intravenous medication at daily intervals for from two to four weeks. Nine patients had idiopathic or arteriosclerotic parkinsonism, and of these 4 were improved. One of these patients had senile chorea rather than true parkinsonism. This patient showed a most striking improvement, suggesting the possibility that therapy with pyridoxine hydrochloride may be of benefit in other types of extrapyramidal involvement. Of the remaining 6 patients, 2 showed improvement. In the latter group 3 had postencephalitic paralysis agitans and 1 the syphilitic form. In the remaining 2 patients the etiologic factors producing paralysis agitans were undetermined.

Four patients suffering from arteriosclerotic or idiopathic paralysis were treated orally with 50 mg. of pyridoxine hydrochloride daily for three weeks supplemented by 54 grains of brewers' yeast. Two of these patients insisted that improvement had occurred but in only 1 was there any objective benefit in the form of an observable decrease in the tremor and rigidity.

The small number of patients and the inadequate dosage do not allow any definite conclusions; however, the results with the oral medication are suggestive and have encouraged me to undertake further investigations with this method of administering pyridoxine hydrochloride, or vitamin B<sub>6</sub>.

## THE CEREBROSPINAL FLUID IN DELIRIUM TREMENS

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Drainage of the cerebrospinal fluid by means of spinal puncture as a therapeutic measure in delirium tremens was introduced by Steinebach<sup>1</sup> in 1915. In that same year Hoppe<sup>2</sup> introduced this procedure in the United States; since then the treatment has become highly popular. Although it is now generally assumed that an increase in intracranial pressure occurs in delirium tremens and that drainage of the cerebrospinal fluid will relieve that tension, few data in support of this hypothesis can be found in the literature.

In a series of 18 cases, Steinebach found 14 patients (75 per cent) to have an increased pressure of the cerebrospinal fluid. However, this conclusion was based on his interpretation of any pressure above 150 mm. of water as abnormally increased, which criterion is not in accord with that generally employed in this country, in which the upper limit of normal is usually considered to be 180 mm. of water.<sup>3</sup> All the pressures observed in his cases were not recorded by Steinebach and hence cannot be reevaluated. With no substantiating data, Hoppe also concluded that the pressure of the cerebrospinal fluid is "always increased in delirium tremens."<sup>2</sup> Similar conclusions without supporting data were made by Goldsmith<sup>4</sup> from studies on patients with alcoholic deliriums and other acute alcoholic psychoses, in which he claimed that in 48 per cent of his cases the cerebrospinal fluid "came out under considerable pressure." Likewise, Levinson<sup>5</sup> stated that in delirium tremens the "cerebrospinal fluid pressure is greatly increased, running as a rule from 150 to 300 mm. of water," but gave no data to support his conclusion. In a similar manner other authors,<sup>6</sup> in discussing the treatment of delirium tremens, have expressed the belief that an increase in intracranial pressure occurs, even though ample demonstration of such a phenomenon is still lacking.

The only study on delirium tremens which cast some doubt on the aforementioned general conclusion was that of Thomas, Semrad and Schwab.<sup>7</sup> These authors reported 40 cases of delirium tremens in 20 of which spinal puncture and drainage were done. In only 12 of their cases were readings of pressure reliable, but in all 12 the pressures of the cerebrospinal fluid were normal. In view of the small number of cases involved, these authors could not definitely negate the concept so generally accepted by others.

In view of the preceding reports, a review of the results obtained from examinations of the cerebrospinal fluid of patients with delirium tremens who were treated

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in the Psychiatric Pavilion of the Cincinnati General Hospital during the past four years was considered to be of value.

The records of 234 patients with delirium tremens admitted to the Psychiatric Pavilion of the Cincinnati General Hospital during the past four years were reviewed for this study. In order to keep the problem unobscured, all cerebrospinal fluids which were contaminated by blood as a result of a traumatic tap or an injury to the head and all fluids which reacted positively to the Wassermann test were excluded from the series.

The punctures were performed in the lumbar region with the patient in the lateral recumbent position. Pressures were measured with the Fremont-Smith modification of the Ayer water manometer. All readings of pressure were discarded unless the patient was relaxed and the measured pressure was a reliable one. The cells were counted in a blood-counting chamber. The majority of the cell counts were made by the glacial acetic acid method, although in the last year Unna's polychrome methylene blue was used for staining the cells prior to counting. The protein determinations

TABLE 1.—Pressure of the Cerebrospinal Fluid in Patients with Delirium Tremens

Pressure, Mm. of Water	Number of Patients	Percentage
Less than 180.....	154	73
180 to 200.....	26	12
200 to 300.....	26	12
300 to 400.....	5	3
Total.....	211	100

TABLE 2.—Protein Content of the Cerebrospinal Fluid of Patients with Delirium Tremens

Protein Content, Mg. per 100 Cc.	Number of Samples	Percentage
10 to 20.....	56	30
21 to 45.....	123	67
46 to 75.....	5	3
Total.....	184	100

were made according to the Ayer, Dailey and Fremont-Smith<sup>8</sup> modification of the Denis and Ayer method. The colloidal gold test was done according to the method of Lange, as described by Cockrill.<sup>9</sup>

#### RESULTS

**Pressure.**—Reliable readings were obtained in 211 cases (table 1). The pressure of cerebrospinal fluid was less than 180 mm. of water in 154 (73 per cent) and above 180 mm. in 55 (27 per cent). In only 5 cases was the cerebrospinal fluid pressure above 300 mm. of water.

**Protein.**—Protein determinations were made on 184 samples of fluid. They were below the accepted upper limits of normal, namely 45 mg. per hundred cubic centimeters of fluid, in 179 instances (97 per cent) and greater than 45 mg. in 5 instances (3 per cent) (table 2). There were 56 samples of fluid which had low values, being below 20 mg.

**Cells.**—Cell counts were recorded on 178 samples of fluid. The count was 5 cells per cubic millimeter or below in 168 fluids (94 per cent), between 6 and

10 cells per cubic millimeter in 7 (4 per cent) and above 10 cells (the highest being 17 cells per cubic millimeter) in 3 (2 per cent). The cells were all lymphocytes.

**Colloidal Gold Test.**—The colloidal gold reaction was determined on 55 samples of fluid and was normal in all of them. For the purpose of this report a reading of less than 2 (lilac) in any tube is reported as a negative reaction.

#### COMMENT

This study indicates that only 25 per cent of patients with delirium tremens have an abnormally high pressure of the cerebrospinal fluid. The vast majority of our patients had a normal pressure, thus invalidating the generalization that there is an increase of pressure in delirium tremens. If one considers that it is difficult to relax properly the patient with delirium tremens for accurate determination of the pressure of the cerebrospinal fluid even under the most favorable conditions, then the probability is enhanced that more than 75 per cent of such patients will have normal pressures.

These observations agree with those of Merritt and Fremont-Smith,<sup>2</sup> who examined the cerebrospinal fluid of 108 patients with acute alcoholic intoxication and found normal pressures in 75 per cent of the series. Likewise, Rosenbaum, Herren and Merritt<sup>10</sup> found normal pressures in 75 per cent of a series of 201 patients suffering with acute alcoholism (including, but not limited to, patients with delirium tremens).

In the aforementioned study by Rosenbaum, Herren and Merritt, about 20 per cent of the series had a slightly increased protein content in the cerebrospinal fluid. However, in the present study only 5 patients (3 per cent) had an increased concentration of protein in the cerebrospinal fluid. This apparent discrepancy probably is due to the fact that the patients in this series had had drainage of the cerebrospinal fluid with an average removal of 35 cc., while the patients examined by Rosenbaum, Herren and Merritt had had diagnostic taps only, with about an average removal of 10 cc. of cerebrospinal fluid. The protein content of the cerebrospinal fluid may be lower in the present series because the cerebrospinal fluid was diluted by ventricular fluid. This finding agrees with the well known fact that the protein content of cerebrospinal fluid varies with the site from which it is taken; the upper limits of protein in ventricular fluid being 15 mg., in cisternal 25 mg. and in lumbar 45 mg.<sup>3</sup>

The fact that the present study reveals the cerebrospinal fluid to be normal in the vast proportion of patients with delirium tremens does not preclude the advisability of performing spinal taps in such cases. The therapeutic advantages of such taps are doubtful,<sup>11</sup> but the diagnostic advantages are made apparent by the fact that in 7 cases in this series the diagnosis of an injury to the head was made in this manner. Adequate examination of spinal fluids revealed the presence of syphilis of the central nervous system in another 7 cases. Hence spinal taps are advocated for diagnostic purposes and not on the basis of reducing a hypothetical increased pressure of the cerebrospinal fluid.

#### CONCLUSION

The cerebrospinal fluid is normal in 75 per cent of patients with delirium tremens.

Burnet and Goodman streets.

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## Clinical Notes, Suggestions and New Instruments

### MAGNIFICATION OF SPERMATOZOA BY MEANS OF THE ELECTRON MICROSCOPE

#### PRELIMINARY REPORT

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Progress in physics and chemistry governs the development of modern medicine. From the time of Leeuwenhoek and his first successful microscope in the seventeenth century, man has been slowly penetrating deeper into the secrets of nature. It is a long cry from Leeuwenhoek's microscope to the binocular microscope with magnifications of 900, 1,500 and 2,000 diameters. Today we are on the eve of amazing discoveries which, in their importance and significance, rival those of William Harvey and Pasteur. The science of medicine is being revolutionized daily. Molecules which not long ago were theoretical entities are now clearly visualized by the electron microscope.

The ordinary refractive microscope revealed nothing more concerning the morphology of spermatozoa than the contour of the head and number and approximate length of tails. All the finer details were hopelessly concealed. Fundamentally, we know little about spermatozoa, and that little may be summed up as (1) motility or nonmotility, (2) general appearance of spermatozoa as seen with magnifications under 2,000 and (3) the numbers of spermatozoa per cubic centimeter of volume of semen. These observations were at one time the only criteria available. It is hardly feasible to think that by looking down from a mountain top into a valley many miles distant one may discern the features of the people and animals inhabiting it. Spermatozoa have presented just such a problem.

For many years it was assumed that motile spermatozoa were fertile. This assumption has since been discredited. Some authors have represented the body of the spermatozoon as being absent, just a head and a tail. Others have stretched their imagination to draw complicated spirem arrangements in the midsections. To obtain the photographs the following method was used:

In order to photograph a specimen through the electron microscope the specimen must be placed in a vacuum. It is therefore necessary to give this specimen added support to avoid disintegration. The microscope is operated with a current varying from 30,000 to 60,000 volts. The specimen of semen from which a spermatozoon was examined and photographed (which photographs are here reproduced) was 0.5 cc. in volume. This was placed in an ordinary test tube and diluted with distilled water to 15 cc. One drop of this specimen was then placed on a fine wire mesh screen, the wire being  $\frac{1}{320}$  inch in diameter. This screen was previously prepared in the following manner:

In a reservoir of distilled water having an outlet in the bottom center, the tiny film of collodion was floated. A small piece of screen mesh was placed over the opening. After a few minutes, in which time the collodion evaporated, the water was very carefully siphoned from the glass dish and the collodion film rested on the mesh. The specimen was then ready to be introduced into the vacuum chamber of the microscope. It is interesting to note that the collodion supports the specimen in such a manner that it can be photographed or observed "for periods of from five weeks to three months." The magnification of the original photograph from which figure 1 was reproduced was 13,500 diameters, and of figure 2, 27,000. The pictures were taken on March 31. There are a number of points of interest which can be seen at these magnifications.

This is offered as a preliminary report, made possible through the courtesy of the R. C. A. Electronic Research Laboratories with the help of Dr. Zvorykin and Dr. Ramberg and the Cooperation of Mr. Pipher, Mr. Rhea, Mr. Volino and Mr. Ray.

The patient whose spermatozoa have been magnified through the electron microscope is a normal man of 32, the father of four children, the youngest being 6 months of age. It may be assumed, therefore, that the spermatozoon here illustrated is fertile and has been observed by the ordinary microscope at a magnification of 900 diameters. The motility was of high index and the longevity was eighteen hours. It can be further concluded that the spermatozoon was what is considered normal.

Human spermatozoa at this magnification in the electron microscope are so large that to photograph one spermatozoon it is necessary to take three separate pictures. This was accomplished by moving the slide while observing the spermatozoon through a large fluorescent screen in the viewing chamber. The magnification may then be adjusted to the desired value. The definition obtained in the small negative is sufficiently fine to allow enlargement up to any magnification desired. Figure 1 is a composite picture taking in the whole spermatozoon after reconstruction from three separate and distinct photographs. Figure 2 is the head and neck.

Measurements taken from a photographic enlargement are given solely for the purpose of showing the ratio of the different parts:

Head: Width at widest part, 7 cm. (from vertex to neck 11 cm.).

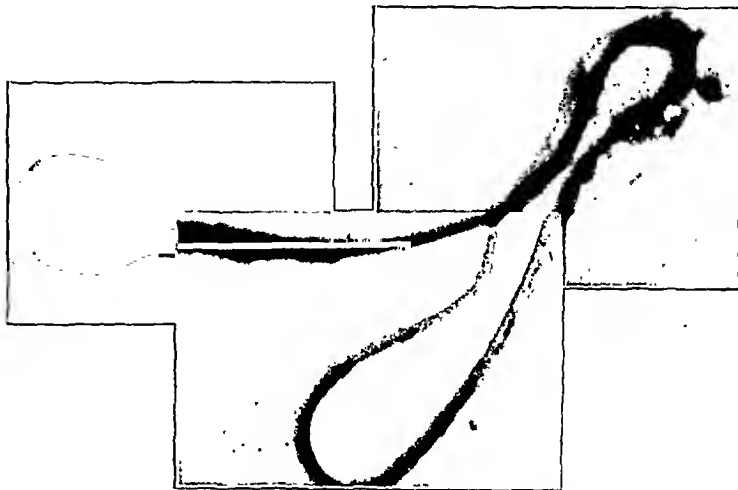


Fig. 1.—Human spermatozoon as viewed with the electron microscope. The original from which this illustration was reproduced was magnified 13,500 diameters. This is a composite of three separate pictures.

Body: Length, from neck to tail, 12 cm.

Tail: Length, from body to what appears to be the termination of the tail, 112 cm.

The head is shaped like a pear. The vertex presents a crater-like notch. The structure within this notch is somewhat less opaque than the main structure of the head, which is completely opaque down to where it vignettes into the body of the spermatozoon. Around the lower end of the "pear" appears a spongelike substance which is contiguous with a similarly appearing structure which runs along the entire length of the body.

The body appears to be a segmented structure, averaging nine to twelve segments in the specimens examined. This body of the spermatozoon is probably the structure, which under the refractive microscope appears as a narrow strip and which was known as the neck. Throughout the length of the body runs a core which is approximately uniform in diameter. This core is distinguished from the rest of the body by its opacity, being denser than the segmented structure around it. The core becomes the tail.

The core of the body surrounded by a narrow margin of substance, similar in opacity to the substance of the body segments, constitutes the tail. On the composite photograph, for a length of approximately 20 cm. from a point where the body terminates, the degree of opacity is apparently uniform.

The opacity then begins gradually to lighten for an approximate distance of 9 cm., where the opacity increases in density over a distance of approximately 9 cm., where it again becomes less dense and continues so throughout the remaining length of the tail. A delicately denser core runs through the length of these two lighter areas, which also show several small, dense, isolated buckshot-like bodies. The tail does not terminate abruptly but breaks up into a blurred, nondescript smudge.

In view of the number of details as revealed in a spermatozoon magnified 27,000 diameters by means of the electron microscope, opening up as this does an entirely new field of experimental research, it can be safely predicted that future investigations will undoubtedly clear up old problems, change our present conceptions of them and create new ones of which we now at present are totally unaware.

The apparent segmentation of the body probably accounts for the extraordinary motility of the head of the spermatozoon as it is propelled in a forward movement. The shape of this part of the spermatozoon has never been so clearly seen before. The crater-like notch on the vertex of the head may very well be some form of suction apparatus to facilitate the penetration of the ovum. With motion pictures we have seen how the



Fig. 2.—Head of human spermatozoon. The original from which this illustration was reproduced was magnified 27,000 diameters.

head of the spermatozoon penetrates the ovum as the first stage of fertilization. This is the first time such a definite irregularity in the structure of the head of the spermatozoa has been seen. As research in these higher magnifications goes on, we may have to throw overboard the old theories of chemotaxis and revamp much of what was heretofore believed true.

#### COMMENT

1. The belief that a spirem formation existed in the body of the human spermatozoon is not confirmed in this examination.
  2. The old conception of the neck must now be changed. We are forced to call the neck the body of the spermatozoon, which appears as a highly complex and segmented structure.
  3. There appears to be a heretofore undiscovered but definite irregularity at the vertex of the head of the spermatozoon which may be a distinct organ, such as a suction apparatus.
  4. The tail is apparently a great deal longer than has been previously supposed, and it contains variations in structure which may be functional in character.
  5. It is possible that the penetration of the spermatozoon into the ovum is effected by means of a specialized apparatus situated at the vertex of the head of the human spermatozoon.
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## Special Articles

### LEGAL RESPONSIBILITY FOR MEDICAL MALPRACTICE

#### III. FORGOTTEN ANCESTORS OF THE AMERICAN LAW OF MEDICAL MALPRACTICE

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*This is the third of a series of six articles on "Legal Responsibility for Medical Malpractice." The two previous articles were published in The Journal March 8 and May 10, respectively.*

In *Hodgson v. Bigelow*, 1939 (7 Atl. [2d] 338), the Supreme Court of Pennsylvania held that a physician's failure to give tetanus antitoxin for a "puncture" wound may constitute civil malpractice. In tracing the genealogy of this important American decision I found its early ancestors to be of English blood.

In the year 1553, Anthony Fitzherbert<sup>1</sup> published his "Natura Brevium," in which is contained the first intimation of the novel principle that one may become liable to another for negligent conduct which constitutes no breach of contract. This augury of a new basis in English law for fixing liability on careless conduct not only presaged the monumental development of tort law, which rose to a position of legal preeminence with the advent of the industrial revolution; it pointed out the way for modern doctrines of medical responsibility. One finds that the following passage which is quoted recurs in the arguments of counsel in English malpractice cases. One finds it alluded to in American decisions as well, even as late as the opinion of the Supreme Court of Pennsylvania in 1853 in the case of *McCandless v. McWha* (22 Pa. 261). Singularly, it deals not with the action of a physician but with the careless conduct of a blacksmith. The "Writ de Trespass sur le Case"<sup>2</sup> reads:

But if a smith prick my horse with a nail, I shall have my action upon the case against him, without any warranty by the smith to do it well; and the writ shall be, wherefore he fixed a certain nail in the foot of a certain horse of J. at N. by which it became corrupted, so that the same horse for a long time could not labour, and he the said J. during that time lost the profit of his horse aforesaid, to the damage etc. For it is the duty of every artificer to exercise his art rightly and truly as he ought.<sup>3</sup>

In 1615, there came before the remarkable Sir Edward Coke, "father of the common law," at the time

1. La nouvelle Natura brevium du Juge tresreverend Monsieur Anthoine Fitzherbert, London, Richard Totell, 1553.

In the preface Fitzherbert said: "In every Art and Science there are certain rules and foundations to which a man ought to give credit, and which he cannot deny."

"In like manner there are divers maxims and fundamentals in the knowledge of the common laws of the land, which a man ought for to believe very necessary for those who will understand the same law, especially at the beginning of their studies; for upon those fundamentals the whole law doth depend."

Any earlier pertinent materials of the common law are embalmed in the court French of the Year Books. Because of doubts as to the accuracy with which these precedents were recorded and their inaccessibility, English courts and counsel have let them lie there, with only occasional crutide allusions to the Abridgements.

2. Ibid., p. 214, D.

3. "If one retains counsel, and gives him his fee to assist him in the purchase of such a manor, if he becomes counsel for another, or discovers his counsel, case lies; yet though he warrants his client that he shall have the manor, but fails therein, yet if he does his endeavor, case does not lie; for perhaps he could not have the manor, i. e., it was impossible." (11 Henry VI, 24.55.)



chief justice of the Court of King's Bench, the case of *Everard v. Hopkins*,<sup>4</sup> from which comes the following passage:

In a special action upon the Case, the plaintiff in his declaration shews, that the defendant being a common Chyrurgeon, had undertaken the cure of his servant, being hurt with a cart-wheel; he shews farther, that he was not only careless of the cure (he being by promise and agreement between them, to have 5 Marks for the same cure) but he had also applied unwholesome Medicines, and with them had put him to more pain, per quod servitium suum amisit, per spatium of one whole year; unde actio.

Coke, Chief Justice said:

It is also here laid, that he did apply, indebita and insalubria Medicina; for this the master may have an action clearly; but the servant cannot have an action upon this agreement, but he may have an action upon the case for his applying of unwholesome medicines to him. It is considerable, whether the master here may have an Action upon the Case, upon an Action upon the Case, this he may have, if the master sends his servant to pay money for him upon the penalty of a bond! and in his way a smith, in shoeing, doth prick his horse, and so by reason of this the money is not paid; this being the servant's horse, he shall have an action upon the case for the special wrong which he had sustained by this, by the non-payment of his money, occasioned by this. . . .

Observe that the ratio decidendi of the case is that a master who has contracted with a physician may recover damages for negligent administration of medicine to his servant. Remarks as to the servant's right of action were unessential to the decision and so constitute mere dictum. Sometimes, however, the dictum of today becomes the law of tomorrow. Such was this case; the dictum that the servant, though a stranger to the contract of employment, had an independent action against the derelict physician on the ground of negligence became law by force of later cases (*Pippin v. Sheppard*, 11 Price 400; *Gladwell v. Steggall*, 8 Scott, 60; 5 Bing. N.C. 733; *Longmeid v. Holliday* [Court of Exchequer 1851] 6 Exch. 761 [dictum]).

There is current in some quarters a false notion that only the "quack" need be concerned with mala praxis. How unsubstantial this belief is can nowhere be better illustrated than in the celebrated English case of *Slater v. Baker and Stapleton* (Common Bench), Michaelmas Term, 8 Geo. III, 1767, 2 Wilson 359. This was a special action on the case against a surgeon and an apothecary for unskilfully disuniting the callus of the plaintiff's leg after it was set.

The facts were these. Slater broke both bones of one leg. A local surgeon set them and attended the patient for nine weeks. By the end of four weeks, callus had formed, and soon after the injured man was beginning to walk a bit with crutches. But a protuberance had arisen, and Slater called in Stapleton, a local apothecary, to remove the bandage from his leg. Stapleton declined to do it himself and prevailed on Slater to call into conference defendant Baker, for twenty years first surgeon of St. Bartholomew's Hospital in London. Evidently Baker was not satisfied with the result, for on his third visit he brought with him a new contrivance of his invention for extending the leg, which he applied without obtaining Slater's consent to its use or to the breaking of the callus and resetting of the bones. One reads:

The defendants came to the plaintiff, Baker took up the plaintiff's foot in both his hands and nodded to Stapleton, and then Stapleton took the plaintiff's leg upon his knee, and the leg gave

a crack, when the plaintiff cried out to them and said "you have broke what nature had formed;" Baker then said to the plaintiff, "You must go through the operation of extension," and Stapleton said, "we have consulted and done for the best."

The leg did not reunite as anticipated, and the plaintiff, who was left with a poorer result, sued both Stapleton and Baker.

Other surgeons called as witnesses testified variously that to disunite the callus was not customary except when the leg as set was very crooked; that the way of making it straight was by compression and not by extension. They had not the least idea of the instrument spoken of for extension. Some said they would not have disunited a hard callus even on the patient's request and that in no case would they do so without his consent. All agreed that Baker was eminent in his profession. One reads further:

A woman called as a witness swore, that when the plaintiff came home he could walk with crutches; that the defendant Baker put on to the plaintiff's leg a heavy steel thing that had teeth, and would stretch or lengthen the leg; that the defendants broke the leg again, and three or four months afterwards the plaintiff was still very ill and bad of it.

The jury awarded a verdict of £500 against the defendants jointly.

The defendants moved that the verdict ought to be set aside; a part of their contention read:

Baker has been above 20 years the first surgeon in St. Bartholomew's Hospital, reads lectures in surgery and anatomy, and is celebrated for his knowledge in his profession as well as his humanity; and to charge such a man with ignorance and unskilfulness upon the records of this court is most dreadful. All the witnesses agreed Mr. Baker does not want knowledge, therefore this verdict ought not to stand.

The whole court, in an opinion upholding the verdict and affirming the judgment, said:

When we consider the good character of Baker, we cannot well conceive why he acted in the manner he did; but many men very skilful in their profession have frequently acted out of the common way for the sake of trying experiments. Several of the witnesses proved that the callus was formed and that it was proper to remove plaintiff home; that he was free from pain and able to walk with crutches. We cannot conceive what the nature of the instrument made use of is: Why did Baker put it on, when he said the plaintiff had fallen into good hands, and when plaintiff only sent for him to take off the bandage? It seems as if Mr. Baker wanted to try an experiment with this new instrument.

2dly, It is objected, that this is not the proper action, and that it ought to have been trespass vi et armis.<sup>5</sup>

In answer to this, it appears from the evidence of the surgeons that it was improper to disunite the callus without consent; this is the usage and law of surgeons: then it was ignorance and unskilfulness in that very particular, to do contrary to the rule of the profession, what no surgeon ought to have done; and indeed it is reasonable that a patient should be told what is about to be done to him, that he may take courage and put himself in such a situation as to enable him to undergo the operation. . . . For anything that appears to the court, this was the first experiment made with this new instrument; and if it was, it was a rash action, and he who acts rashly acts ignorantly: and although the defendants

5. The plaintiff had a clearcut cause of action for the battery arising from the breaking of his leg, to which he had not given his consent, and for this immediate, intended contact trespass vi et armis was the appropriate action. To support it the plaintiff would not need to prove negligence but only lack of consent and consequent injury.

But in this instance plaintiff sued in "case," and to support this form of action he needed to prove negligence; so the court was confronted with the interesting question: Can an intentional, unauthorized act toward a patient sufficient to constitute "battery" at the same time constitute "negligence"? The answer is yes when the omitted consent is to an experimental treatment attended with risk of failure and is therefore, in the view of the medical profession, improper to apply without prior consultation of the patient.

Today in such cases the plaintiff usually proceeds on the theory of battery, because of the fewer elements required to make proof.

4. *Everard v. Hopkins* (Court of Kings Bench) 1615, 2 Bulst. 332; 1 Roll. Rep. 124; 80 E. R. 1164.

in general may be as skilful in their respective professions as any two gentlemen in England, yet the court cannot help saying, that in this particular case they have acted ignorantly and unskilfully, contrary to the known rule and usage of surgeons.

This case illustrates several interesting points:

1. The eminence of the practitioner and the purity or benevolence of his motive afford no defense to a civil action for malpractice. This follows because the object of the action is not punishment of the physician for moral turpitude but compensation for an injury caused by medical dereliction. The actionable violation of the patient's right of personal integrity may consist of either intentional or negligent conduct.

2. One who collaborates, even in a minor role, in the culpable act, as did Stapleton in holding the leg, becomes equally liable in damages as a "joint tortfeasor." Pending opportunity to give deserved comprehensive attention to the important question of joint responsibility in medical transactions, the general rule may be stated thus: It is possible for two physicians to be called in to treat the same patient concurrently and yet for neither to be liable for the lack of skill or the negligence of the other. They have a right to make such division of the medical service to be rendered as, in their sound judgment, circumstances require. In such case each, in serving with the other, is held answerable for his own medical conduct and for all wrongful acts or omissions of the other that he observes and permits to continue without protest or which, using reasonable diligence, he should have noticed; but this, in main, is the limit of his liability. (*Morey v. Thybo*, 199 Fed. 760, 118 C.C.A. 198, 42 L.R.A. [N.S.] 785).

3. Though one might suppose that by submitting himself to treatment a patient thereby impliedly consents to any procedure which the physician deems appropriate and administers in good faith, this assumption is too broad. In respect to unusual procedures the physician should disclose his intention and preferably put before the patient the alternatives, the intended purpose and a fair statement of the risk, all with a view to enabling the patient to make a fair choice and to give his actual consent.<sup>6</sup> It may be well to bear in mind two types of cases: (1) those in which a physician wishes to try a novel or experimental remedy not yet applied as a medical measure to the treatment of human beings, even though its value has been demonstrated by animal experimentation and laboratory tests and even though in the opinion of the user it is intrinsically sound, and (2) all cases in which some procedure is proposed which is calculated to effect radical alteration of the status quo, with an element of appreciable risk, such as certain operations or the administration of drugs involving a substantial hazard of tissue damage or of profound constitutional reactions. The latter cases are not so clearcut as those in group 1, but they demand thought as to whether bare consent of the patient is enough to warrant going ahead with the procedure. In *Theodore v. Ellis* (Supreme Court of Louisiana, 1917) 75 So. 655, it was held that a first drainage operation for a disorder of the bladder was warranted under a broad consent from the patient but that subsequent

lobectomy of the prostate gland, when the surgeon had not made a full disclosure of the nature of the operation and its purpose, was not.

This obligation of disclosure has a reasonable basis in fair play toward the patient. But it rests even more solidly on the duty of disclosure springing (1) from the relationship of trust and confidence between physician and patient, which partakes of a fiduciary character, and (2) from the obligation an expert may owe to a novice. Usually parties deal at arm's length, and neither owes the other the benefit of his superior knowledge ("caveat emptor"). But when one person is an expert in possession of technical information necessary to the enlightened decision of a novice who justifiably relies on him for guidance, a duty to disclose material facts may arise. The case is even stronger in regard to the physician, for it may be argued that his very employment is in part as a counsellor on health. An interesting analogy exists in the law of trusts. If A conveys property to B, as trustee, for the use and benefit of C, a trust is created. B, for purposes of administering the property, has the full authority incident to possession of the legal title (similar to that of a physician whose general control is authoritative in managing the health of the sick patient). The trustee can negotiate ordinary transactions in the interest of the trust without consulting C, the beneficiary, who holds the equitable title. But if he proposes any unusual investment or any action which may threaten dissipation of the corpus (principal or "body" of the trust), he must make a full disclosure to the beneficiary and obtain his informed consent before he takes such action. Otherwise he is responsible for consequent injury.

4. *Slater v. Baker* shows that what is "due care" and what is negligence in medical practice is a question of fact, determinable by the jury in each new case. The jury is to be guided by the testimony of expert witnesses as to what the average practitioner at the time and the place of the conduct would consider prudent or bad practice.

5. Lastly, it stands for the now well established principle that when the plaintiff's action is based on the defendant's failure to use due skill in a particular transaction, evidence as to the skill the defendant used in treating other patients is not admissible.<sup>7</sup>

A case which has been much more cited both in America and in England than its intrinsic value merits is that of *Seare v. Prentice*, decided in 1807 by Lord Ellenborough, then chief justice of the King's Bench<sup>8</sup> (8 East, 347; 103 E.R. 376). Seare, a shoemaker, brought an action on the case against the defendant, Prentice, whom he had employed as a surgeon, for negligently, ignorantly and unskilfully reducing his dislocated elbow and fractured arm. At the trial, Justice

7. Results of similar treatment of other patients has probative value and is admissible when defendant's professional capacity is put in issue or a claim is made that the very method of treatment itself was medically improper.

8. It was he who decided the remarkable case of *Ashford v. Thornton*, 1 Barn. and Ald. 405, (1818). Richard Thornton, on jury trial at Warwick, was found "not guilty" of the murder of Mary Ashford, whereupon her brother, William Ashford, sued out an appeal of murder against him. Appellee Thornton, when he was brought into the Court of King's Bench, pleaded *viva voce*: "Not guilty, and I am ready to defend the same by my body," and taking a gauntlet from his right hand, he threw it on the floor. Judge Ellenborough reviewed the ancient common law precedents and was forced to conclude that no change had been made in the almost forgotten rule that "the mode of trial by law in such a case of appeal is by 'battle,' at the election of the appellee except where the appellee is an infant or a woman or above sixty years of age." He declared: "The law of the land is in favour of the trial by battle, and it is our duty to pronounce the law as it is, and not as we may wish it to be." There was great excitement at this prospect of a trial by combat, and the public expected to see the battle fought out before the judges at Tothill Fields; but Ashford, being more resolute in the law than in the lists, refused to proceed further, and the appeal was dismissed. The case occasioned a sensation and resulted in the statute of 59 Geo. III c. 46, which abolished criminal appeals and trials by battle in writs of right.

6. Substantial reasons may legally justify nonobservance of the normal duty to disclose. For instance, suppose a person is so ill that his life can be saved only by a drug the administration of which is itself attended by some risk, such as sulfanilamide for a patient with streptococcal septicemia due to otitis media. The patient is of nervous temperament or so prostrate that disclosure of the danger might precipitate a fatal crisis. The drug may be administered without disclosure of the risk involved.

Heath instructed the jury that unless negligence was proved they could not investigate the want of skill. Since the evidence did not substantiate negligence, a verdict was brought in for the defendant, under direction of the judge. In reviewing the proceedings, Lord Ellenborough found that the defendant was entitled to a verdict because "no want of skill was imputed to the defendant," but he condemned the dictum of the trial court that unless negligence was proved the jury could not investigate the want of skill. Since, as he confessed, the question did not arise on the evidence, it follows that Ellenborough's own remarks on the subject are themselves mere dictum, because unnecessary to a decision of the case, but they have been cited often. One reads:

... an ordinary degree of skill is necessary for a surgeon who undertakes to perform surgical operations; which is proved by the case of *Wilson*, and indeed by all analogous authorities; in the same manner as it is necessary for every other man to have it in the course of his employment; as the farrier who undertakes to cure my horse must have common skill at least in his business, and that is implied in his undertaking; and although I am ready to admit that a surgeon would be liable for *crassa ignorantia*, and would be justly responsible in damages for having rashly adventured upon the exercise of a profession, without the ordinary qualification of skill, to the injury of a patient: yet the question did not arise upon the evidence in this case; for no want of skill was imputed to the defendant: and therefore the opinion of the learned Judge upon that point does not affect the merits of the verdict upon the evidence in the case.

English lawyers sometimes assert that this case was the first to lay down the rule that a physician must use skill as well as care. I have shown, however, that "unskilfulness" was made the basis of decision in the earlier English case of *Slater v. Baker and Stapleton* (1767) and was recognized as far back as Roman law.<sup>9</sup>

Many courts, today, speak of negligence and failure to use due skill as separate legal entities. Actually, they can mean by so doing only to break down negligent conduct of a medical case into causal components. The various deficiencies which may result in a negligent performance may be represented as follows:

1. X is ignorant, lacking in education or specific information necessary for the particular undertaking.

*Example.*—X, who has operated only on the abdomen and never familiarized himself with surgical procedures on the brain, in a nonemergency in a city where competent brain surgeons are available essays a difficult operation on the brain. He is unable to complete it successfully because of failure to foresee the necessity for certain special instruments and precautions.

Though he uses all the care and skill he has, the very assumption, unnecessarily, of an undertaking beyond his preparation is negligent and permeates the entire conduct of the case.

But note: the law is interested in his incapacity primarily because of the injury done to the patient through the resulting inability to conduct the case properly. If the same surgeon, despite his poor qualification, completes the operation successfully, his undertaking the task still remains "negligent" by common usage but not in law, because the treatment itself, the actual conduct of the case, is free from fault. The physician has acted at his peril, but the ominous dangers threatened by his rash assumption to act have not materialized.

2. X is well informed as to theory but lacks in requisite experience and so in the skill demanded by the undertaking.

*Example:* A recently graduated medical student who has not taken a surgical internship or had actual experience is profoundly versed in the literature on surgical operations on the brain. He essays a (nonemergency) operation on the brain, believing he can duplicate one of the operations which he has seen Dr. Harvey Cushing do or one of which he has read descriptions. The operation fails for want of skill.

3. X has information and experience, but due to inaptitude he has never acquired the skill possessed by the "average practitioner" in his community.

*Example:* A practitioner of long standing fails to reduce and set a Colles fracture with the skill which the average practitioner would employ. Marked deformity results.

4. X has information, experience and skill but fails to apply skill to the particular case, with consequent injury.

*Example:* X knows that aminopyrine is a dangerous drug but prescribes it freely for persistent headache without making periodic studies of the blood or carefully checking the clinical response. Full-blown granulocytopenia develops in the patient.

5. X has information, experience and skill but in a transaction not requiring skill fails to use such care or diligence as the average practitioner would apply.

*Example:* X abandons the care of a patient with a simple ailment without legally terminating the relationship of physician and patient. In consequence, a preventable complication develops which the average practitioner in attendance could have prevented.

6. X has knowledge, judgment, care and skill but fails to apply average judgment to the transaction.

*Example:* A child under 2 years of age is admitted to a hospital with osteomyelitis and shows evidences of acute infection and septicemia, profound dehydration and shock; the surgeon performs an immediate, radical surgical operation, which precipitates death. In the face of contraindications which would invariably deter the average surgeon, precipitate action without clinical basis may involve negligence, however carefully and skilfully the operation is performed. In this case the basis is failure to exercise average judgment.

7. X has knowledge, judgment, care and skill but fails to maintain control of the medical transaction; or he entrusts properly delegable functions to one he reasonably should have known to be incompetent.

*Example:* X, in carrying out an abdominal operation, relies on "green" nurses, pressed into emergency service, to make the count of the sponges used, without personally verifying its accuracy. A retained sponge causes tissue necrosis.

*Example:* While conducting a vitally important investigation of a patient's renal function, X delegates the laboratory work to Y, an independent laboratory technician (an independent contractor), whose results have several times been found undependable. Y negligently arrives at erroneous conclusions. As the result of the normal reports, the patient is subjected to a contraindicated operation. X had reasonable notice of Y's incompetence; it was therefore negligent to entrust the investigations to her or, in the alternative, to accept her results without verification.

Note: 1. In all of these instances, the dereliction may lie either in an affirmative act (misfeasance) or

9. Smith, H. W.: Legal Responsibility for Medical Malpractice: I. The Legal Matrix of Medical Malpractice, J. A. M. A. 116:942 (March 8) 1941.

in an omission to act when there is a duty to do so (nonfeasance). In the presence of a physician-patient relationship, whether the omitted action is negligent depends on whether a prudent physician would have considered neglect to do the omitted thing as bad practice. The mere fact that he himself, in like circumstances, would have done the omitted thing is not enough: he might have considered it wise through an abundance of caution, while current practice would not have considered the omission as culpable.

2. In each case, the standard of knowledge, judgment, care or skill which the practitioner must bring to bear is that which the average practitioner of his own class and community would apply under similar circumstances.

3. There may be combinations of two or more of these seven causes of negligent conduct of a case.

One of the most influential statements of principle in respect to the law of malpractice occurred in the charge to the jury given by Tindal, chief justice, in the English case of *Lanphier and Wife v. Phipos* (cases at nisi prius), 1838, 8 Carrington & Payne, 475.

The facts were these. Mrs. Lanphier, in September 1835, while traversing a field became alarmed at the spectacle of an approaching cow, gave a sudden turn, tripped and fell on the wrist of her right hand, causing "a fracture of the small bone of the arm, and a partial dislocation of the third bone of the palm of the hand." The defendant was called and arrived within an hour after the fall. A neighbor, testifying for the plaintiff, declared she expressed the opinion to the physician that the wrist was injured but that he took hold of the patient's hand and then gave a contrary opinion. He said the injury was not in the wrist but in the arm, put splints on and bound it from below the elbow to the wrist, leaving the hand hanging down. Swelling gradually increased, and vinegar was applied by the defendant's direction, and he expressed his opinion that "it was doing very well." The witness drew his attention to the increase of swelling and inflammation, and he removed the splints and examined the arm; whenever she spoke to him on the subject, he expressed the opinion that it was doing very well. The splints were kept on for about seven weeks. The inflammation spread to the shoulder, and the husband was alarmed and complained, so the defendant sent some kind of oil to bathe it. The witness told him that if it were hers (Mrs. Jones's) she would not be satisfied with the way in which it was progressing; but he still said he thought it was doing very well. When the defendant had attended the patient about seven weeks, she retained a new surgeon, V. He applied longer splints, which supported the hand, and instituted special treatment to reduce the inflammation; but despite improvement, the patient lost the use of her hand, so that she could not use a knife or fork or dress or undress herself with it.

On these facts, at the trial, Mr. Calloway, of Guy's Hospital, and Mr. Tyrrell, of St. Thomas's Hospital, were allowed to give their opinions.

Both considered that defendant's treatment of the case was injudicious, particularly in suffering the hand to hang down, and in not making sufficient efforts, by lotions and other means, to reduce and keep down the inflammation.

For defendant, Mr. Luke of the London Hospital, who examined the injury in June 1937, under a judge's order, testified that in his opinion there had not been any mismanagement on the part of the defendant and that such was the opinion of the second surgeon, V. Three other surgeons, after hearing

Mr. Luke's evidence of what he discovered and ascertained on the examination, expressed it as their opinion that the defendant was not at all to blame.

Tindal, chief justice, in summing up, after stating the pleadings, charged the jury as follows:

What you will have to say is this, whether you are satisfied that the injury sustained is attributable to the want of a reasonable and proper degree of care and skill in the defendant's treatment. Every person who enters into a learned profession undertakes to bring to the exercise of it a reasonable degree of care and skill. He does not undertake, if he is an attorney, that at all events you shall gain your case, nor does a surgeon undertake that he will perform a cure; nor does he undertake to use the highest possible degree of skill. There may be persons who have higher education and greater advantages than he has, but he undertakes to bring a fair, reasonable, and competent degree of skill, and you will say whether, in this case, the injury was occasioned by the want of such skill in the defendant. The question is, whether this injury must be referred to the want of a proper degree of skill and care in the defendant or not. The action is not brought for any injury sustained by the husband, but it is brought by the wife for the injury which she has sustained by the loss of the use of her hand. The husband must be joined in the action, but the damages are to be given for the injury sustained by her. His Lordship then read and commented on the evidence, and then left the case to the jury, who found a verdict for the plaintiff. Damages £100.

In surveying English common law, one feels constrained to see what Blackstone said on the subject. In his "Commentaries on the Laws of England"<sup>10</sup> is this passage:

4. Injuries affecting a man's health are where, by any unwholesome practices of another, a man sustains any apparent damage in his vigour or constitution. As by selling him bad provisions, or wine; by the exercise of a noisome trade, which infects the air in his neighborhood; or by the neglect or unskilful management of his physician, surgeon, or apothecary. For it hath been solemnly resolved, that mala praxis is a great misdemeanour and offence at common law, whether it be for curiosity and experiment, or by neglect; because it breaks the trust which the party has placed in his physician, and tends to the patient's destruction.

The learned Blackstone stated the rule correctly but erred as to its reasons. He said the physician's dereliction is a misdemeanor, resting on a "breach of trust." I have shown, on the contrary, that the usual basis is civil and that at common law medical responsibility springs partly from "contract" (an implied warranty by the physician in accepting employment that he possesses average qualifications) and partly from "tort" (especially doctrines of negligence). Both of these bases of liability rest on principles of compensation for injury rather than of punishment for a delict. Later it will be seen that of these two the "tort" basis is of greater importance. A neighboring passage suggests that Blackstone fell into error because he was thinking of the Roman law.

The precedents which have just been surveyed have a peculiar interest as the earliest "blood ancestors" of the present law of malpractice both in England and in the United States. Their intrinsic worth also warrants attention, for their doctrines are still law. They have been added to and elaborated by the later cases but not overturned. They have been left behind, but they still point the direction in which the law is traveling.

10. Blackstone, William: *Of Wrongs and Their Remedies, Respecting the Rights of Persons, in Private Wrongs*, in *Commentaries on the Laws of England*, Oxford, 1769, book 4, chap. 8, p. 122.

GLANDULAR PHYSIOLOGY AND  
THERAPY

## ADRENAL CORTEX INSUFFICIENCY

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*This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—Ed.*

CLINICAL PICTURE OF ADRENAL CORTEX  
INSUFFICIENCY

The syndrome of adrenal cortex insufficiency was first described by Thomas Addison, in his classic treatise, published in 1855. This symptom complex as observed in Addison's disease is characterized by an insidious onset and progressive development of fatigability and asthenia to the point of utter exhaustion, associated with varying degrees of anorexia, nausea and vomiting. Very occasionally diarrhea and abdominal pain are present. The symptoms may appear in the course of weeks, months or even years. At times, however, the tempo of the disease may be greatly accelerated. This may occur either spontaneously or in response to a withdrawal of sodium salts from the diet, or in association with an acute infection, and may, in the course of a few days, terminate fatally. These abrupt episodes of adrenal insufficiency are termed "crises." In a few instances the symptoms and signs of hypoglycemia may dominate the clinical picture, particularly among patients receiving salt or desoxycorticosterone acetate therapy.

Pigmentation and arterial hypotension are the physical signs usually exhibited by patients with adrenal cortex insufficiency. The pigmentation is brownish and may be either diffuse or blotchy in distribution. It is most typically observed in the mucous membranes of the buccal cavity. However, there are patients in whom no pigmentation develops. Hypotension is almost invariably present among patients seeking medical aid, but under emotional stress the blood pressure may momentarily rise to normal or even to abnormal levels. During crises it falls to strikingly low levels, and the patient presents a picture of dehydration and shock.

## PATHOLOGIC PHYSIOLOGY

In the past decade great advances have been made in the clarification of certain mechanisms involved in the development of adrenal cortex insufficiency. These have been discussed extensively elsewhere in this series, but, since they constitute the basis of present therapy, it is essential that those with clinical significance be considered briefly at this point.

**Salt and Water Metabolism.**—In 1927 Baumann and Kurland<sup>1</sup> and Marine and Baumann<sup>2</sup> showed that the sodium concentration in the blood of adrenalectomized cats was decreased and that a solution of sodium

chloride prolonged life more effectively than did solutions of other electrolytes or of dextrose. In 1932 and 1933 it was shown by the writer<sup>3</sup> that the concentration of sodium in the blood of patients suffering from uncompensated adrenal cortex insufficiency was decreased and that replacement of the sodium ion relieved this condition. It was also shown that withdrawal of the sodium ion from the diet of patients with Addison's disease precipitated acute adrenal cortex insufficiency.<sup>4</sup> It was then observed in dogs that the loss of sodium following adrenalectomy results from increased excretion of sodium ions by the kidney.<sup>5</sup> These observations have been amply confirmed,<sup>6</sup> and Harrop and associates<sup>7</sup> and Allers<sup>8</sup> independently pointed out that adrenalectomized dogs could be maintained in good health indefinitely if sodium salts were administered in sufficient amounts, particularly if the potassium content of the diet was reduced. A disturbance in water metabolism is intimately related to that of the concentration of sodium ions in adrenal cortex insufficiency. Thus, there is a tendency for water to be lost as the insufficiency progresses up to the point where a fall in blood pressure causes oliguria.<sup>9</sup> This is associated with a consistent decrease in plasma volume. However, water is not, as a rule, lost from the body as rapidly as is sodium. This is shown by the fact that the sodium concentration of the blood decreases. It has been shown that acute adrenal cortex insufficiency may be induced in a patient with Addison's disease by restricting the intake of fluid, despite the administration of salt. Under these conditions a crisis associated with a fall in blood pressure, collapse and a decrease in plasma volume without a decrease in blood sodium appeared in a patient studied by Willson and Sunderman.<sup>10</sup> A loss of sodium without a decrease in plasma volume, i. e., without a simultaneous loss of water, does not regularly give rise to the picture of adrenal cortex insufficiency.

**Potassium Metabolism.**—An increase in the concentration of the potassium ion was first observed in animals by Baumann and Kurland,<sup>1</sup> in 1927, and in human subjects with adrenal insufficiency by the writer in 1932.<sup>3</sup> This disturbance is closely related to disturbances in sodium and water metabolism. In general, as sodium is lost from the body, potassium in the blood serum tends to increase and the ability of the body to excrete potassium ions is impaired. Kendall and associates<sup>10</sup> and Zwemer and Truszkowski<sup>11</sup> empha-

3. (a) Loeb, R. F.: Chemical Changes in the Blood in Addison's Disease, *Science* **76**: 420 (Nov. 4) 1932; (b) Effect of Sodium Chloride in Treatment of a Patient with Addison's Disease, *Proc. Soc. Exper. Biol. & Med.* **30**: 808 (March) 1933.

4. (a) Harrop, G. A.; Weinstein, Albert; Soffer, L. J., and Trescher, J. H.: The Diagnosis and Treatment of Addison's Disease, *J. A. M. A.* **100**: 1850 (June 10) 1933. (b) Harrop, G. A.: Diagnosis and Treatment of Addison's Disease, *ibid.* **101**: 338 (July 29) 1933. Loeb.<sup>3b</sup>

5. Loeb, R. F.; Achley, D. W.; Benedict, Ethel M., and Leland, Jessica: Electrolyte Balance Studies in Adrenalectomized Dogs with Particular Reference to the Excretion of Sodium, *J. Exper. Med.* **57**: 775 (May) 1933.

6. Harrop, G. A.; Soffer, L. J.; Ellsworth, Read, and Trescher, J. H.: Studies on Suprarenal Cortex: III. Plasma Electrolytes and Electrolyte Excretion During Suprarenal Insufficiency in the Dog, *J. Exper. Med.* **58**: 17 (July) 1933. Harrop and others.<sup>4</sup>

7. Harrop, G. A.; Soffer, L. J.; Richardson, W. N., and Strauss, Margaret: Studies on the Suprarenal Cortex: IV. The Effect of Sodium Salts in Sustaining the Suprarenalctomized Dog, *J. Exper. Med.* **61**: 839 (June) 1935.

8. Allers, W. D.: Influence of Diet and Mineral Metabolism on Dogs After Suprarenalctomy, *Proc. Staff Meet., Mayo Clin.* **10**: 406 (June 26) 1935.

9. Willson, D. M., and Sunderman, F. W.: Studies in Serum Electrolytes: The Effect of Water Restriction in a Patient with Addison's Disease Receiving Sodium Chloride, *J. Clin. Investigation* **18**: 35 (Jan.) 1939.

10. Allers, W. D.; Nilson, H. W., and Kendall, E. C.: Studies on Adrenalectomized Dogs: The Toxic Action of Potassium, *Proc. Staff Meet., Mayo Clin.* **11**: 283 (April 29) 1936.

11. Zwemer, R. L., and Truszkowski, R.: Potassium: A Basic Factor in the Syndrome of Cortico-Adrenal Insufficiency, *Science* **83**: 558 (June 5) 1936.

From the Departments of Medicine and Neurology, College of Physicians and Surgeons, Columbia University, and the Presbyterian Hospital and Neurological Institute.

1. Baumann, E. J., and Kurland, S.: Changes in the Inorganic Constituents of Blood in Suprarenalctomized Cats and Rabbits, *J. Biol. Chem.* **71**: 281 (Jan.) 1927.

2. Marine, David, and Baumann, E. J.: Duration of Life After Suprarenalctomy in Cats and Attempts to Prolong It by Injections of Solutions Containing Sodium Salts, Glucose and Glycerol, *Am. J. Physiol.* **81**: 86 (June) 1927.



sized the susceptibility of adrenalectomized animals to the injection or ingestion of potassium salts. Wilder and his collaborators<sup>12</sup> emphasized the danger attendant on the ingestion of large amounts of potassium salts by patients with Addison's disease. Despite the deleterious effects of the potassium ion in adrenal cortex insufficiency, the concept that death from this insufficiency results from potassium poisoning is untenable.

**Renal Function.**—Marshall and Davis<sup>13</sup> were the first to point out, in 1916, an increase in nonprotein nitrogen in the blood of adrenalectomized animals. In patients with adrenal cortex insufficiency an increase in nonprotein nitrogen, inorganic phosphorus and sulfate may occur. Furthermore, decreases in urea clearance may be present even in the absence of nitrogen retention. These disturbances have been shown by Stahl, Kuhlmann and Urban<sup>14</sup> to be associated with hemoconcentration and presumably with a decrease in renal blood flow. Observations on creatinine clearance in adrenal cortex insufficiency by Margitay-Becht and Gömöri<sup>15</sup> led to the same inference. The disturbances in electrolyte and water metabolism already discussed are to a large extent referable to a derangement of normal renal activity<sup>16</sup> other than that resulting in decreased renal blood flow. It seems probable that this derangement is related to tubular reabsorption.

**Carbohydrate Metabolism.**—Porges,<sup>17</sup> in 1909, was the first to report the presence of hypoglycemia in patients suffering from Addison's disease and in adrenalectomized animals. In recent years the studies of Britton and Silvette,<sup>18</sup> Long and his colleagues<sup>19</sup> and Kendall and his associates<sup>20</sup> have shown that a decrease in glycogen storage in the liver and in sensitivity to insulin are also characteristic of adrenal cortex insufficiency.<sup>21</sup> The disturbances in carbohydrate metabolism vary considerably in different species, and they vary greatly in intensity in persons with Addison's disease, but they may be of sufficient gravity to prove fatal. It is generally believed that the abnormalities of carbohydrate metabolism result from a decrease in the utilization of carbohydrate and a decrease in gluconeogenesis.<sup>22</sup> The disturbances in carbohydrate metabolism as seen in Addison's disease vary independently of the disturbances in salt and water metabolism.<sup>23</sup> It has been amply established by the work of Long and asso-

ciates,<sup>19</sup> Thorn,<sup>24</sup> Kendall<sup>20a</sup> and our own laboratory<sup>25</sup> that various steroids isolated from the adrenal cortex exhibit striking differences in their effect on carbohydrate and electrolyte metabolism.

**Nitrogen Metabolism.**—Nitrogen retention and a decrease in the excretion of ammonia appear in the development of severe adrenal cortex insufficiency and are probably in part due to decrease in renal blood flow. Following the administration of various extracts of adrenal cortex there is often a temporary increase in the urinary excretion of nitrogen perhaps due to improvement in renal function. On the other hand, it has been shown by Long and co-workers<sup>19</sup> and Kendall and his associates<sup>20a, b</sup> that the nitrogen excretion of diabetic rats or of fasting normal rats may be increased by the administration of certain adrenal steroids. This increase has been shown to be due to gluconeogenesis from body protein, which may be the primary effect, but which possibly arises in response to a decrease in the utilization of carbohydrate.

**Adynamia.**—This manifestation of adrenal cortex insufficiency, which plays a major part in the subjective manifestations of Addison's disease, has been extensively studied by Ingle<sup>26</sup> in rats. From the results of his work it is certain that adynamia results chiefly from the disturbances in carbohydrate metabolism and to a lesser extent from the loss of salt and water and decrease in blood flow. Whether or not other factors play a part is not known.

**Arterial Hypotension.**—The fall in blood pressure to shock levels during crises of adrenal cortex insufficiency is dependent to a large extent on the disturbances in salt and water metabolism. The chronic but milder degrees of hypotension may also be dependent on the same abnormality, since the blood pressure may be raised by the administration of sodium salts as well as by the administration of desoxycorticosterone acetate, which primarily affects the metabolism of salt and water. Whether other factors contribute to hypotension is not known.

**Miscellaneous Disturbances.**—Among these, pigmentation occupies a prominent position. This abnormality, although not universally present in Addison's disease, is extremely common, yet its mechanism remains totally obscure. Sensitivity to change in temperature, particularly to cold, and sensitivity to pain stimuli, which are characteristics of patients and animals in adrenal cortex insufficiency, may possibly be correlated with the disturbances in carbohydrate and in electrolyte metabolism, as indicated by the studies of Kendall.<sup>20a</sup> The moderate lowering of the basal metabolic rate occasionally observed is probably on a similar complex basis. The mechanisms acting in the production of hypercalcemia, elevation of serum phosphatase, retention of bromsulphalein and gynecomastia, all of which are sometimes present in Addisonian patients, are not known. Focal and diffuse neurologic disorders in adrenal cortex insufficiency result probably from hypoglycemia or from decreased cerebral blood flow or from both.

In 1933 Swingle and collaborators<sup>27</sup> suggested that a hormone of the adrenal cortex had an effect on the

12. Wilder, R. M.; Kendall, E. C.; Snell, A. M.; Kepler, E. J.; Rynearson, E. H., and Adams, Mildred: Intake of Potassium: An Important Consideration in Addison's Disease: A Metabolic Study, Arch. Int. Med. 59: 367 (March) 1937.

13. Marshall, E. K., Jr., and Davis, D. M.: The Influence of the Adrenals on the Kidneys, J. Pharmacol. & Exper. Therap. 8: 525 (Sept.) 1916.

14. Stahl, Jules; Kuhlmann, D., and Urban, M.: A propos du mécanisme de l'insuffisance rénale au cours de l'insuffisance surrénalienne expérimentale, Compt. rend. Soc. de biol. 127: 1286, 1938.

15. Margitay-Becht, A., and Gömöri, P.: Die Nierenfunktion bei der Addisonischen Krankheit, Ztschr. f. d. ges. exper. Med. 104: 22, 1938.

16. Harrison, H. E., and Darrow, D. C.: Renal Function in Experimental Adrenal Insufficiency, J. Clin. Investigation 17: 505 (July) 1938.

17. Porges, O.: Ueber Hypoglykämie bei Morbus Addison sowie bei nebennierenlosen Hunden, Ztschr. f. klin. Med. 69: 341, 1909-1910.

18. Britton, S. W., and Silvette, Herbert: The Apparent Prepotent Function of the Adrenal Glands, Am. J. Physiol. 100: 701 (May) 1932.

19. Long, C. N. H.; Katzin, B., and Fry, E. G.: The Adrenal Cortex and Carbohydrate Metabolism, Endocrinology 26: 309 (Feb.) 1940.

20. (a) Kendall, E. C.: The Function of the Adrenal Cortex, Proc. Staff Meet., Mayo Clin. 15: 297 (May 8) 1940. (b) Sprague, R. G.: The Influence of Extract of the Adrenal Cortex on Glycogenesis in Fasting Rats, Proc. Staff Meet., Mayo Clin. 15: 291 (May 8) 1940. (c) Wells, B. B.: The Influence of Crystalline Compounds Separated from the Adrenal Cortex on Gluconeogenesis, Proc. Staff Meet., Mayo Clin. 15: 294 (May 8) 1940.

21. This view of an intimate relation between carbohydrate metabolism and the function of the adrenal cortex has been amply confirmed and is contrary to that expressed by the writer in the first edition of this book.

22. Long and others.<sup>19</sup> Kendall and others.<sup>20</sup>

23. Loch, R. F.; Atchley, D. W., and Parson, William: The Significance of Certain Chemical Abnormalities Found in the Blood in Addison's Disease, Tr. A. Am. Physicians 52: 228, 1937.

24. Thorn, G. W.: Personal communication to the author.  
25. Ferrel, J. W.; Ragan, Charles; Atchley, D. W., and Loeb, R. F.: A Comparison of Certain Effects of Desoxycorticosterone Acetate, Corticosterone and Cortical Extract in a Patient with Addison's Disease, Endocrinology 27: 360 (Sept.) 1940.  
26. Ingle, D. J.: The Work Performance of Adrenalectomized Rats Treated with Corticosterone and Chemically Related Compounds, Endocrinology 26: 472 (March) 1940.  
27. Swingle, W. W.; Pfaffner, J. J.; Vars, H. M.; Bett, P. A., and Perkins, W. M.: The Function of the Adrenal Cortical Hormone and the Cause of Death from Adrenal Insufficiency, Science 77: 58 (Jan. 13) 1933.



peripheral vascular bed. The evidence provided was not convincing. However, the fact that an extract of the adrenal cortex may effect prompt relief in dogs suffering from severe adrenal cortex insufficiency without causing demonstrable changes in the blood volume or the electrolyte pattern<sup>28</sup> suggests the possibility of action either on tissue of the nervous system or perhaps on the capillaries. Furthermore, Menkin<sup>29</sup> has recently shown that extract of adrenal cortex inhibits the dilatation of capillaries which usually results from the cutaneous injection of leukotaxine or exudates. The significance of these observations in relation to adrenal cortex insufficiency is not yet apparent.

#### TREATMENT OF ADRENAL CORTEX INSUFFICIENCY

The treatment of adrenal cortex insufficiency and that of diabetes mellitus have much in common. In both diseases therapy should be directed toward (1) the specific replacement of the hormone or hormones lacking, (2) the correction of the physiologic disturbances resulting from hormonal deficiencies and (3) the avoidance of those factors known to intensify the abnormalities present. The treatment of adrenal cortex insufficiency as exemplified by Addison's disease is also analogous to that of diabetes in that often a few simple measures suffice to control the disease, whereas at times the failure to institute vigorous therapeutic measures promptly may result in a fatal outcome which might have been avoided. Thus, in a patient whose symptoms and signs of adrenal cortex insufficiency are mild, ingestion of a moderate amount of salt in addition to that present in the diet, moderate limitation of the potassium content of the diet, avoidance of extremes of heat and cold, as well as avoidance of mental and physical strain, may be adequate to maintain moderately good health for months or years. On the other hand, when a crisis develops either in the natural course of the disease or because of salt withdrawal, diarrhea, acute infection, surgical intervention or other factors, an immediate intensive attempt to restore base and water by all possible means becomes imperative to avoid fatal peripheral circulatory collapse.

In recent years the treatment of Addison's disease has been advanced materially through (1) the introduction of salt therapy, (2) the restriction of potassium salts, (3) the elaboration of extracts of the adrenal cortex and (4) the synthesis and availability of desoxycorticosterone esters. The role of each of these must be considered in detail.

**Role of Salt and Diet.**—With the ingestion of 7 to 20 Gm. of salt in addition to that of the diet, many patients with Addison's disease can be restored to moderately good health for months or years, as stated. Most of these patients take their salt in enteric-coated 1.0 Gm. tablets distributed at frequent intervals during the course of the day. Others prefer to take their salt in the form of an approximately 1 per cent solution. Only a few are able to tolerate capsules. Wilder and associates have suggested that part of the sodium be taken in the form of citrate or bicarbonate to avoid chloride retention. In the writer's experience this has rarely proved necessary.

It should be pointed out that before the advent of desoxycorticosterone many patients in severe addisonian crises recovered as a result of the parenteral adminis-

tration of liberal amounts of physiologic solution of sodium chloride. This treatment not only restored base but also lowered the blood potassium and nonprotein nitrogen to normal, improved renal function, raised the blood pressure and relieved peripheral circulatory collapse.

Wilder and his associates<sup>12</sup> have properly advocated the restriction of potassium in the diet of the salt-treated patients with adrenal cortex insufficiency, and Sister Mary Victor<sup>30</sup> has carefully outlined the technic of the preparation of this type of diet.<sup>31</sup> In view of the capricious appetites of most patients with Addison's disease, the rigid restriction of the intake of potassium becomes more a theoretical than a practical consideration. In patients who cannot be maintained in good health through the ingestion of large amounts of salt and moderate restriction of the intake of potassium, treatment with desoxycorticosterone esters is indicated. The treatment of hypoglycemic episodes occurring in Addison's disease is best accomplished by the ingestion of a glass of orange juice or two lumps of sugar. If the patient is unable to cooperate, 50 cc. of a 25 per cent solution of dextrose may be given intravenously. Infusions of large amounts of dextrose are apt to give rise to hyperglycemia, followed in the course of two to four hours by a recurrence of hypoglycemia.

**Desoxycorticosterone Acetate.**—Since Steiger and Reichstein<sup>32</sup> synthesized desoxycorticosterone, this natural steroid of the adrenal cortex has become available for the treatment of patients and has initiated a new era in the therapy of adrenal cortex insufficiency. This particular substance, as has been suggested in another chapter, affects almost exclusively electrolyte and water metabolism, as has been demonstrated by the studies of Thorn and his associates,<sup>33</sup> and Cleghorn and his co-workers,<sup>34</sup> Levy Simpson<sup>35</sup> and Loeb and his collaborators<sup>36</sup> (shown in the accompanying chart). It causes striking retention of sodium salts with restoration of the blood sodium level to normal. It also causes retention of water with increase in plasma and interstitial fluid volume and consequent gain in weight. It lowers the serum potassium, at times to abnormally low levels, and temporarily increases the excretion of this ion. It restores renal function and increases the excretion of nitrogen when nonprotein nitrogen has been retained. Desoxycorticosterone esters also cause a decrease in the concentration of total protein, calcium

30. Mary Victor, Sister: Directions for the Planning of Diets Low in Content of Potassium, Proc. Staff Meet., Mayo Clin. 12: 424 (July 7) 1937.

31. The following foods should be rigidly avoided: soups, broths, gravies, catsup, dried fruits and vegetables, bran and molasses. The consumption of milk, meat and leguminous vegetables should be moderately restricted. Meats and vegetables should be cut into small pieces and cooked in 6 to 8 volumes of water.

32. Steiger, Marguerite, and Reichstein, T.: Partial Synthesis of a Crystallized Compound with the Biological Activity of the Adrenal Cortical Hormone, Nature 139: 925 (May 29) 1937.

33. (a) Thorn, G. W.; Howard, R. P.; Emerson, Kendall, Jr., and Firor, W. M.: Treatment of Addison's Disease with Pellets of Crystalline Adrenal Cortical Hormone (Synthetic Desoxy-corticosterone Acetate) Implanted Subcutaneously, Bull. Johns Hopkins Hosp. 64: 339 (May) 1939. (b) Thorn, G. W.; Howard, R. P., and Emerson, Kendall, Jr.: Treatment of Addison's Disease with Desoxy-Corticosterone Acetate, a Synthetic Adrenal Cortical Hormone (Preliminary Report), J. Clin. Investigation 18: 449 (July) 1939. (c) Levy Simpson, S.: Discussion on Recent Developments in the Treatment of Addison's Disease, Proc. Roy. Soc. Med. 32: 685 (Dec. 13) 1938.

34. Cleghorn, R. A.; Fowler, J. L. A., and Wenzel, J. S.: The Assay of Desoxycorticosterone Acetate and Its Use in the Treatment of Addison's Disease, J. Clin. Investigation 18: 475 (July) 1939.

35. Levy Simpson, S.: The Use of Synthetic Desoxycorticosterone Acetate in Addison's Disease, Lancet 2: 557 (Sept. 3) 1938.

36. (a) Loeb, R. F.; Atchley, D. W.; Ferrebee, J. W., and Ragan, Charles: Observations on the Effect of Desoxycorticosterone Esters and Progesterone in Patients with Addison's Disease, Tr. A. Am. Physicians 54: 285, 1939. (b) Ferrebee, J. W.; Ragan, Charles; Atchley, D. W., and Loeb, R. F.: Desoxycorticosterone Esters: Certain Effects in the Treatment of Addison's Disease, J. A. M. A. 112: 1725 (Nov. 4) 1939.

28. Stahl, Jules; Atchley, D. W., and Loeb, R. F.: Observations on Adrenal Insufficiency, J. Clin. Investigation 15: 41 (Jan.) 1936.

29. Menkin, Vally: Effect of Adrenal Cortex Extract on Capillary Permeability, Am. J. Physiol. 129: 691 (June) 1940.

and cholesterol in the serum, probably because of the hemodilution associated with an increase in plasma volume.

There are great variations in the responses to desoxycorticosterone esters in patients suffering from adrenal cortex insufficiency. These are important to recognize and as yet impossible to anticipate. For example, in studies at the Presbyterian Hospital,<sup>36b</sup> in New York, one patient became markedly edematous and gained 11 Kg. in ten days, during which time he received 10 Gm. of salt a day and 19 mg. of desoxycorticosterone propionate daily. On the other hand, another patient receiving the same diet and the same amount of salt gained but 2 Kg. in thirty days, during which time he received 25 mg. of the same synthetic product each day. Normal persons on this regimen gain but minimal amounts of weight.

The arterial blood pressure of patients with Addison's disease who are treated with desoxycorticosterone esters rises. In conjunction with salt solution administered

disturbances of electrolyte and water metabolism, just as it may appear in patients receiving adequate amounts of salt alone. Recent studies<sup>37</sup> of patients receiving other steroids of the adrenal cortex, e. g., corticosterone and compound E of Kendall, as well as cortical extract, indicate that massive doses of these substances have some effect on carbohydrate metabolism. Unfortunately, the amounts of these steroids necessary to produce a significant effect are not available for clinical use, and the amount of cortical extract required to elevate the blood sugar and prevent hypoglycemia is in most cases almost prohibitive.

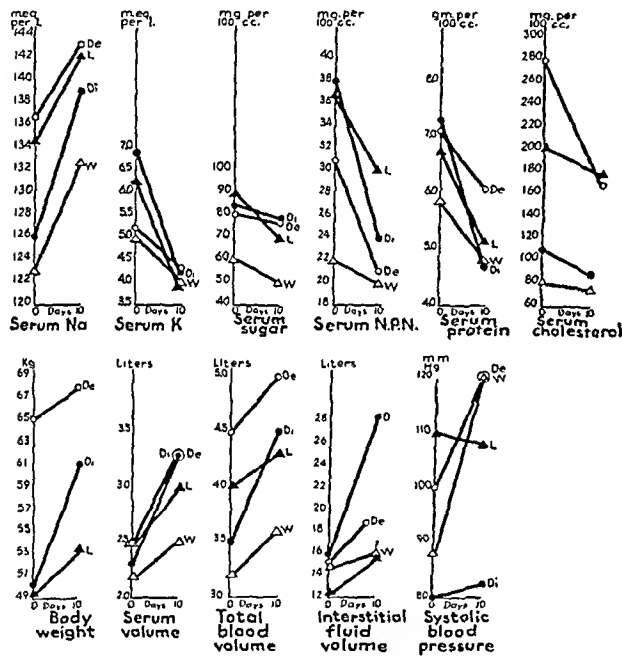
There is no definite evidence that the pigmentation of the patient with Addison's disease is influenced by desoxycorticosterone esters. It is true that patients under treatment with the synthetic compound and salt appear lighter in color, but it seems likely that this change should be ascribed to rehydration rather than to depigmentation. I have not seen pigment spots in the oral mucous membranes disappear under any form of treatment. Possibly more definite knowledge concerning pigment metabolism will be forthcoming when patients have been under treatment for longer periods.

Subjectively, desoxycorticosterone esters tend to increase the sense of well-being, the strength, the appetite and the outlook on life of patients with Addison's disease. A number of patients resume work, and many others are able, from the standpoint of strength, to take up normal activities. It must be remembered, however, that the majority of patients with Addison's disease suffer from tuberculous infection, and this constitutes a therapeutic problem in itself.

#### Administration of Desoxycorticosterone Esters.—

Two general technics for the treatment of adrenal cortex insufficiency with desoxycorticosterone acetate or propionate have been developed. Thorn and his co-workers<sup>38a</sup> and Levy Simpson<sup>38c</sup> have prepared and implanted subcutaneously, with great success, pellets of a crystalline preparation (synthetic desoxycorticosterone acetate). Others<sup>38</sup> have administered desoxycorticosterone esters subcutaneously or intramuscularly in solutions of peanut or sesame oil. Desoxycorticosterone is only sparingly soluble in water and is essentially without effect when patients with Addison's disease take it by mouth.

The preparation of pellets for implantation presents two problems. The first is that of sterility, which is difficult to obtain, because high temperatures destroy the compound. The second problem is concerned with the pressure under which pellets are prepared. If they are too solidly packed, their solubility is slight. If they are too loosely packed, absorption is apt to be irregular and, indeed, if they crumble, absorption may be very rapid, and serious overdosage may ensue. Thorn<sup>38a</sup> has prepared and standardized his pellets so that from each is dissolved 0.3 to 0.4 mg. of desoxycorticosterone acetate daily. After the daily requirement of the substance is determined in the patient with Addison's disease who takes about 4 Gm. of salt a day in addition to that of a normal diet, by means of daily subcutaneous injections of desoxycorticosterone acetate, the pellets are implanted subcutaneously below the scapula. Enough pellets are used so that the number implanted will yield about two thirds of the subcutaneous requirement. This procedure allows a margin of safety in that if the pellets produce symptoms or signs of overdosage, the salt intake may be reduced. If the



Effects produced in patients with Addison's disease in ten days by a desoxycorticosterone derivative. These patients received large doses, i. e., about 190 mg., during the initial ten days of treatment.

during crises, the drug may cause a rise in pressure from shock levels in the course of a few hours. In other patients the rise in blood pressure may be gradual over a period of two to four weeks. At times hypertension may appear. Thus, in four of the patients studied by us there has been a rise in blood pressure to 175/100, 160/92, 160/110 and 146/108 respectively. Whether or not these patients had underlying hypertensive disease, masked by Addison's disease, is not known. It is also not known whether the rise in blood pressure is dependent on factors other than the correction of the disturbances of electrolyte and water metabolism.

An important fact to be borne in mind is that desoxycorticosterone esters have no demonstrable effect on the carbohydrate metabolism of patients with Addison's disease. No definite effect on the fasting blood sugar, dextrose tolerance curves or respiratory quotients has been observed. Furthermore, spontaneous and severe hypoglycemia may appear in patients receiving enough synthetic desoxycorticosterone to correct

37. Thorn,<sup>21</sup> Ferrebee and others.<sup>23</sup>  
38. Wilder, R. M.: Progress in Treatment of Addison's Disease, Proc. Staff Meet., Mayo Clin. 15: 273 (May 1) 1940. Levy Simpson,<sup>21</sup> Ferrebee and others.<sup>23</sup>

pellets are not quite enough to maintain the sodium concentration of the blood at a normal level, the salt intake may be increased, or supplementary doses of desoxycorticosterone acetate may be injected, or more pellets may be implanted.

When patients are treated with daily subcutaneous injections instead of pellets, they are trained in the technic of injection as are diabetic patients who take insulin. The patients in our experience<sup>36b</sup> do best on a normal diet of average salt content, and the dose of desoxycorticosterone ester is adjusted under these conditions.

Patients should be under close observation during the regulation of their dosage. They should be weighed daily and their blood sodium, serum protein, potassium, nonprotein nitrogen and sugar should be determined initially if possible. The vital capacity, the venous pressure and the size of the heart as determined by roentgen examination should be observed from time to time, as these examinations and auscultation of the chest afford the best evidence of impending cardiac insufficiency, a complication occasionally occurring in the course of treatment.

The maintenance requirements of desoxycorticosterone acetate or propionate vary greatly in different patients. In our series the dose necessary to maintain the normal blood electrolyte pattern has varied from 1 mg. to 7 mg. daily.

In the presence of a crisis or at the beginning of treatment in the presence of moderately severe insufficiency, larger doses may be required for two or three days. A dose of 15 mg. may perhaps be given safely twice a day, provided the patient is carefully watched for evidence of overdosage. In the presence of a severe crisis the administration of desoxycorticosterone acetate should be supplemented by one or two daily infusions of 1,500 cc. of physiologic solution of sodium chloride until the patient is able to take food and fluid by mouth. No further definite rules can be advanced for the treatment of the patient in a crisis, as the desoxycorticosterone and salt requirements differ widely not only in different patients but also in the same individual at different times.

**Surgical Procedures.**—Before the advent of desoxycorticosterone acetate, major surgical operations in patients with Addison's disease almost invariably proved fatal. At the present time an operation may be undertaken with comparative safety if the disturbances of electrolyte and water metabolism are first corrected with synthetic desoxycorticosterone. No specific regimen for anteoperative therapy can be outlined, but in some instances the injection of 25 mg. of desoxycorticosterone acetate four hours before operation and perhaps 1 liter of saline solution serves to prevent serious depletion and consequent shock. In the postoperative period the patient must be watched for evidence of adrenal cortex insufficiency, including hypoglycemia, as well as for manifestations of overdosage. The amounts of desoxycorticosterone and salt must be adjusted to these indications.

**Complications.**—Desoxycorticosterone esters which produce the striking salutary effects described in patients with adrenal cortex insufficiency may at times give rise to dangerous complications. Among the first 18 patients whom we<sup>36</sup> treated with the synthetic substance at the Presbyterian Hospital there were 15 in whom edema developed, varying from transient puffiness of the face or ankles to massive anasarca. In 5 of these patients there developed also varying degrees of

respiratory distress and a sense of tightness of the chest associated with roentgen evidence of dilatation of the heart, predominantly on the right side. In some of these patients there occurred an elevation of venous pressure, roentgen and clinical evidence of pulmonary congestion and a decrease in vital capacity. Cardiac insufficiency developing as a consequence of desoxycorticosterone therapy has been observed also by others. This complication of therapy is fortunately reversible in most instances but may prove fatal. The mechanisms responsible for the development of cardiac insufficiency have not been definitely established. Arterial hypertension cannot be of great importance, as congestive failure appeared in 3 patients in whom the systolic pressure was below 110 mm. of mercury. An increase in plasma volume and a decrease in the serum potassium concentration may be of importance. It is of interest that Ragan,<sup>39</sup> at the Presbyterian Hospital, has been able to produce cardiac dilatation in adrenalectomized dogs by massive doses of desoxycorticosterone acetate and sodium chloride, but he has observed no effect in normal animals.

Not only have patients under treatment with desoxycorticosterone esters suffered from varying degrees of cardiac insufficiency, but in our series 6 of 20 patients given this therapy in the last twelve months have died. Of these, 1 died of cardiac insufficiency, 1 died of disseminated tuberculosis and 1 died at home presumably of adrenal cortex insufficiency when the dose of the synthetic compound was reduced excessively for the relief of mild symptoms of cardiac insufficiency. Two other patients died suddenly at home without the cause of death being determined. Finally, a patient died suddenly while under observation in the hospital. She had mild cardiac insufficiency and mild hypoglycemia (blood sugar 62 mg. per hundred cubic centimeters). Her blood sodium and potassium had been normal three days before death, and at autopsy no adequate cause for her sudden demise was determined. Our experiences are entirely similar to those recently reported by Wilder<sup>38</sup> and by Thompson and co-workers.<sup>40</sup>

Thus, it is apparent that while desoxycorticosterone therapy has proved exceedingly useful, it is not devoid of danger. Furthermore, it should not be considered a panacea in the treatment of the numerous disturbances present in adrenal cortex insufficiency. It has been shown to have no demonstrable effect on carbohydrate metabolism in patients with adrenal cortex insufficiency and no definite effect on pigmentation. It does not completely relieve the symptom of adynamia, as might be anticipated from Ingle's study.<sup>40</sup> Finally, a number of patients, apparently adequately controlled from the standpoint of electrolyte and water metabolism, died rather suddenly and for no obvious cause. Excessive doses of desoxycorticosterone cause a periodic paralysis associated with a sharp decrease in blood potassium. This paralysis is relieved by the administration of potassium chloride. It is possible that sudden weakness appearing in patients treated with synthetic hormone may, at times, have a similar basis.

**Adrenal Cortex Extract.**—Commercial preparations of adrenal cortex have, in large amounts, been shown to have definite effects on water and electrolyte<sup>41</sup> as

39. Ragan, Charles: Unpublished data.

40. Thompson, W. O.; Thompson, Phebe K.; Taylor, S. G., and Hoffman, W. S.: Treatment of Addison's Disease with Desoxycorticosterone Acetate, *abstr. J. A. M. A.* **114**: 688 (Feb. 24) 1940.

41. Thorn, G. W.; Garbutt, H. R.; Hitchcock, F. A., and Hartman, F. A.: The Effect of Cortin on the Sodium, Potassium, Chloride, Inorganic Phosphorus and Total Nitrogen Balance in Normal Subjects and in Patients with Addison's Disease, *Endocrinology* **21**: 202 (March) 1937.

well as carbohydrate metabolism. The effects are, however, small, and it seems unlikely, as stated before, that these extracts in the doses usually administered have significant clinical value. On theoretical grounds, extract of adrenal cortex should prove of greater value than desoxycorticosterone, as it contains other steroids which are known to have greater and more diversified action, particularly in relation to carbohydrate metabolism. Unfortunately, the concentrations of these steroids are not sufficiently high to prove of real value in small doses. On the basis of our studies<sup>25</sup> it does not seem probable that doses of less than 5 cc. of cortical extract contain clinically significant quantities of steroids that would affect the carbohydrate metabolism. Consequently, the injection of 5 cc. amounts of extract, even in conjunction with the administration of desoxycorticosterone acetate, does not seem indicated in the maintenance of the patient.

Despite these criticisms, it seems probable that 50 to 75 cc. at least of commercial extract given in divided doses in the course of twenty-four hours in addition to saline infusions and with repetition of the dosage the next day may prove more satisfactory in treating serious crises than will desoxycorticosterone acetate alone.

Although cortical extracts have been shown to be active when administered by mouth, the amounts necessary are probably at least 3 to 4 times that of the parenteral dose. Consequently oral administration is of doubtful clinical value.

Studies on adrenalectomized animals have shown that a number of preparations of adrenal cortex extract have demonstrable potency when administered orally. Pfiffner and his co-workers<sup>41a</sup> estimated that 10 cc. of their preparation given by mouth was equivalent to about 1 cc. given parenterally. Thorn<sup>41b</sup> demonstrated that the glycerin extract of 1,000 Gm. of adrenal glands administered by mouth daily to a 10 Kg. adrenalectomized dog maintained the animal in good health. Grollman<sup>41c</sup> has also reported activity of a charcoal adsorbate of adrenal cortex extract. On the basis of these and similar findings the oral administration of extracts has been recommended in the treatment of patients. In view of the relative inactivity of the usual cortical extracts administered parenterally in doses of 5 cc. or less, it is unlikely that considerably larger amounts given by mouth have any significant therapeutic effect. The observations of the writer support this view. Thus one patient was given oral doses of a commercial glycerin extract costing from \$5 to \$15 a day over a period of some months. The extract was given in addition to salt and had little if any clinical effect. This patient's disease is now easily controlled by small doses of desoxycorticosterone acetate. Another patient whose disease was controlled both by desoxycorticosterone acetate in doses of 1 to 2 mg. daily and by about 15 Gm. of salt was given 15 tablets of an oral preparation in conjunction with vitamin C daily. When the salt intake was reduced to 5 Gm. a day, symptoms of acute insufficiency developed in three days with a fall in sodium from 136 to 129 m. eq. per l. despite the large dose of oral extract. A third patient taking 6 tablets of the same preparation and 3 Gm. of salt a day in addition to her diet was admitted to the hospital because of progressive weakness, anorexia and

nausea. Her blood sodium on admission was 124.8 m. eq. per liter. A single infusion of salt solution, the discontinuation of the oral cortical extract preparation and an increase in the daily salt intake to 12 Gm. a day for four days resulted in clinical improvement associated with a rise in blood sodium to 135 m. eq. per liter. It is the writer's opinion that, in the presence of established adrenal insufficiency, cortical extract given by mouth has no place in treatment, particularly now that desoxycorticosterone acetate is available.

Numerous attempts have been made to transplant an adrenal gland or the cortical cells of a gland from one person to another in the treatment of Addison's disease. These efforts have not met with success up to the present time, and the procedure is not to be recommended. Ingle has devised an ingenious method for the successful transplantation of the adrenal glands of a newborn rat into another young rat, but this procedure is so far only of academic interest. Auslander<sup>42</sup> has recently reported successful heterotransplants of adrenal cortex free from medullary cells. These observations have not been confirmed.

#### TREATMENT OF MISCELLANEOUS CONDITIONS

Preparations of the adrenal cortex have been employed in recent years in the treatment of various conditions ranging from nonspecific fatigue to surgical shock. At the present time it is difficult to appraise the value or wisdom of administering these preparations in the absence of demonstrable adrenal cortex insufficiency, since their continued administration is known to cause atrophy of the adrenal glands of normal animals.<sup>43</sup> However, Perla and his co-workers<sup>44</sup> have offered evidence suggesting that anteoperative treatment with saline solution and desoxycorticosterone acetate prevents surgical shock, and Scudder<sup>45</sup> has advocated the use of large quantities of extract of adrenal cortex in the treatment of that condition. These studies receive theoretical support from the observations of McAllister<sup>46</sup> and of Ragan and his associates.<sup>47</sup> These workers have shown that desoxycorticosterone esters administered three to six hours before operation prevent the usual decrease in plasma volume accompanying ether anesthesia and surgical operation.

Weil and Browne<sup>48</sup> reported that the urinary substances protecting young adrenalectomized rats from the fatal effects of exposure to cold are not excreted by normal human beings but appear in the urine following febrile illnesses and other forms of stress. Although the significance of this report is not yet apparent, it does not justify indiscriminate administration of preparations of the adrenal cortex.

42. Auslander, E. M.: Immediate and Late Results of Transplantation of the Suprarenal Cortex in Fourteen Cases in Addison's Disease, *Novy khir. arkhiv.* 42: 375, 1938.

43. Ingle, D. J.; Higgins, G. M., and Kendall, E. C.: Atrophy of the Adrenal Cortex in the Rat Produced by Administration of Large Amounts of Cortin, *Anat. Rec.* 71: 363 (July 25) 1938. Wells, J. B., and Kendall, E. C.: A Qualitative Difference in the Effect of Compounds Separated from the Adrenal Cortex on Distribution of Electrolytes and on Atrophy of the Adrenal and Thymus Glands of Rats, *Proc. Staff Meet., Mayo Clin.* 15: 133 (Feb. 28) 1940. Unpublished data from the Presbyterian Hospital.

44. Perla, David; Freiman, D. G.; Sandberg, Marta, and Greenberg, S. S.: Prevention of Histamine and Surgical Shock by Cortical Hormone (Desoxycorticosterone Acetate and Cortin) and Saline, *Proc. Soc. Exper. Biol. & Med.* 43: 397 (Feb.) 1940.

45. Scudder, John: Shock: Blood Studies as a Guide to Therapy, Philadelphia, J. B. Lippincott Company, 1940.

46. McAllister, F. F.: The Effect of Ether Anesthesia on the Volume of Plasma and Extracellular Fluid, *Am. J. Physiol.* 124: 391 (Nov.) 1938.

47. Ragan, Charles; Ferreebe, J. W., and Fish, G. W.: Effect of Desoxycorticosterone Acetate upon Plasma Volume in Patients During Ether Anesthesia and Surgical Operation, *Proc. Soc. Exper. Biol. & Med.* 42: 712 (Dec.) 1939.

48. Weil, Paul, and Browne, J. S. L.: A Cortin-like Action of Extracts of Human Urine, *Am. J. Physiol.* 126: P652 (July) 1939.

41a. Pfiffner, J. J.; Swingle, W. W., and Vars, H. M.: The Cortical Hormone Requirements of the Adrenalectomized Dog, with Special Reference to a Method of Assay, *J. Biol. Chem.* 104: 701 (March) 1934.

41b. Thorn, G. W.; Emerson, K., Jr., and Eisenberg, H.: Oral Therapy in Adrenal Insufficiency, *Endocrinology* 23: 403 (Oct.) 1938.

41c. Grollman, A.: The Adrenals, Baltimore, Williams & Wilkins Company, 1936.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING CHAPTER, WHICH IS THE SIXTH OF A SERIES ON AMPUTATIONS AND ARTIFICIAL LIMBS TO APPEAR IN THIS COLUMN. WHEN COMPLETED, THE SERIES WILL BE PUBLISHED IN THE FORM OF A HANDBOOK ON AMPUTATIONS. THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION FOR THE COOPERATION OF ITS GROUP OF CONSULTANTS ON ARTIFICIAL LIMBS. THE COUNCIL IS REPRESENTED BY DRs. FRANK D. DICKSON, HARRY E. MOCK, FRANK R. OBER, S. PERRY ROGERS, PAUL STEELE AND PHILIP WILSON, AND THE ASSOCIATION OF LIMB MANUFACTURERS OF AMERICA IS REPRESENTED BY MESSRS. MCCARTHY HANGER SR., W. E. ISLE, JOSEPH A. SPIEVAK, DAVID E. STOLPE AND J. B. KORRADY.

HOWARD A. CARTER, Secretary.

### CHAPTER II—SECTION V

#### REAMPUTATIONS AND SECONDARY OPERATIONS

Careful adherence to the general principles involved in amputations will prevent or lessen the need for reamputations. Nevertheless, in the hands of the best surgeons reamputation is occasionally necessary. Reoperations on the stump are more often needed. The following conditions are the commonest causes for these secondary operations and reamputations:

1. *Sloughing or Ulceration Over the End of the Stump.*—In spite of the most careful technic the posterior fascial flap, in leg amputations, may become detached from the bone, leaving the tibia covered only by skin. Ulceration at this point occurs and sloughing may result in leaving a portion of the tibia exposed. Again infection occasionally develops in the soft tissues of the stump, necessitating removal of sutures and retraction of the skin and fascial flaps with resulting exposure of the end of the tibia. In lower leg amputations done because of circulatory disease or for diabetes, one cannot use too long an anterior flap lest it tend to undergo necrosis along its margin. It is exceedingly difficult to do plastic skin operations on a stump with the bone thus exposed. It is far wiser to reopen the stump by cutting away the ulcerated portion and reforming the best possible flaps, saw away the exposed portion of bone and treat it as one would at a primary amputation. Reamputation of the fibula at a suitable level, reinjection of exposed nerves and religation of major vessels are indicated. These complications usually arise in leg stumps which were originally cut too long, so that reamputation frequently provides a stump capable of better function than the original. When the stump is 8 or 10 inches below the knee, the reamputation may be performed 3 to 5 inches higher, thus providing better flaps with a better selection for the location of the scar. Fortunately a stump 5 or 6 inches in length gives better healing and better leverage for the use of the prosthesis than does the original 8 or 10 inch stump. There is less tendency toward sloughing of the flap when the original operation is performed in these higher sites. The usual mistake which so often necessitates these reamputations is our effort to leave a long lower leg stump.

2. *Cutaneous Defects Over the Sides of the Stump.*—When the ulceration occurs on the side of the stump and not directly over the bone, it is usually caused by impairment of circulation due to too tight a flap. It may also be due to pressure of a socket on soft tissues that are too bulky or redundant. Such areas may be dissected away, allowed to form a good granulation bed and then skin grafted. Skin grafts are satisfactory, however, only if the area is one not subjected to pressure within the socket. Plastic operations with the formation of pedicled flaps from skin adjacent to the stump may be used, provided the site of the pedicled graft can be closed by primary suture and is not itself subjected to pressure from the socket. Pedicled grafts from the opposite extremity are occasionally indicated. Unless infection is very mild or absent, the site of defect must be carefully cut away and the wound allowed to granulate and become healthy before the graft is applied. Redundance of skin and soft tissues may be excised and closed by primary suture with excellent results provided the scar is placed at a point not subjected to pressure within the prosthesis.

3. *Osteomyelitis or Aseptic Necrosis of the End of the Bone.*—It is unusual for an active, suppurating type of osteomyelitis to occur; an aseptic necrosis or low grade osteomyelitis is more common. A severe infection is opened and packed like any osteomyelitis. In the absence of severe infection, clean excision of all dead tissues and reamputation may be performed. Fresh flaps should be dissected free of their original scars and all important structures dealt with as in a primary amputation. Special care is needed to avoid redundancy of soft tissues.

4. *Neuromas.*—Painful stumps are usually due to nerves caught in scar tissue or to typical neuromas. Seldom is reamputation for this condition necessary. However, when one is convinced that the painful stump is real, exploration of the scars or direct attack on the neuroma is indicated. The offending nerve is carefully dissected from the surrounding tissue, cut away higher up and the end of the nerve injected with absolute alcohol.

5. *Neuroses.*—Neuroses of all descriptions frequently develop with the symptoms referred to the stump or even to the amputated member. True malingering in a case of amputation is exceedingly rare. One must not be too prone to jump to the conclusion that the patient's complaints are of a neurotic order. A minute nerve caught in a scar can give the pain, twitching sensation or even the picture of causalgia so often complained of. Furthermore, reoperations do not always disclose or remove the cause. One must approach these cases with a sympathetic understanding rather than a brusque statement that the patient only imagines the complaint. These cases are problems for both the surgeon and the fitter of the artificial limb, who is often unjustly accused for the complaints. Before considering reamputation because of a painful stump and before recommending the purchase of a new artificial limb for the cure of a similar complaint, one must rule out a true neurosis as the cause of symptoms. Conversely, the surgeon must be very careful in his remarks to the patient complaining of pain in the stump or in his criticism of the prosthesis worn lest inadvertently he sow seeds of neurosis in the mind of a susceptible individual.

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

### AN APPRECIATION

The Council on Physical Therapy is most desirous of expressing its sincere appreciation to the following consultants who have given so generously of their time and effort during the past year in assisting the Council in its work:

Drs. Fred L. Adair, Howard Ballenger, M. Herbert Barker, Walter M. Boothby, Milton B. Cohen, W. Allen Conroy, Earl C. Elkins, Samuel Feinberg, Hart Fisher, Hubert H. Hathaway, John S. Hibben, Archibald Hoyne, K. K. Jones, Louis Katz, Disraeli Kobak, Arno Luckhardt, Harry E. Mock Jr., C. O. Molander, Tell Nelson, Benjamin Orndoff, S. L. Osborne, George Shambaugh Jr., William O'Neill Sherman, E. M. Smith, Kellogg Speed and Grant E. Ward.

*Audiometers and Hearing Aids.*—Drs. C. C. Bunch, George M. Coates, E. P. Fowler, Isaac Jones, Douglas Macfarlan, C. Stewart Nash, Horace Newhart, Paul Sabine, B. R. Shurly and W. P. Wherry.

*Educational Work.*—Drs. Frances Baker, Benjamin Boynton, Muriel Case Downer, F. H. Ewerhardt, Richard Kovacs, Fred B. Moor, W. H. Northway, Walter M. Solomon, Arthur L. Watkins and Walter J. Zciter.

*Röntgen Rays.*—Drs. William E. Chamberlain, Arthur C. Christie, E. C. Ernst, Gioacchino Failla, F. M. Hodges, John T. Murphy, Robert C. Newell, Eugene Pendergrass, U. V. Portmann, Lauriston S. Taylor and J. L. Weatherwax.

*Artificial Limbs.*—Drs. S. Perry Rogers, Paul Steele and Philip Wilson, and Messrs. McCarthy Hanger Sr., W. E. Isle, J. B. Korrady, Joseph Spievak and David E. Stolpe.

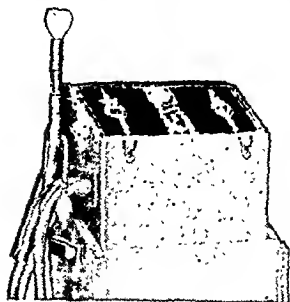
*Electrocardiographs.*—Drs. A. R. Barnes, George Fahr, Harold E. B. Pardee, W. D. Stroud, Carl J. Wiggers and Herbert N. Wilson.



## NEWMAN THERMO-FLO ACCEPTABLE

Manufacturer: Majestic Surgical Instrument Company, 2608 Cicero Avenue, Chicago.

The Newman Thermo-Flo is designed to be used for the intravaginal application of superheated air. In operation, heated air is circulated through a specially shaped thin-walled rubber bag, which is inserted in the vagina in a collapsed state and then inflated with air so as to distend the vagina. The rubber bag is brought into contact with the tissues, and heat is conducted over a large area to the surrounding tissues.



Newman Thermo-Flo.

The apparatus consists essentially of a fan which circulates air through the applicator bag, an electrical unit which heats the air, a thermostat for controlling the temperature (temperatures up to 130 F. may be obtained), a thermometer which extends through the applicator and into the bag, and a hand-operated rubber bulb used to

inflate the rubber bag. The pressure, approximately  $\frac{1}{2}$  to  $\frac{3}{4}$  pound, is indicated on the pressure gage mounted on the control panel.

As evidence of its therapeutic usefulness, the firm submitted a summary of the results of 402 cases treated with the Thermo-Flo at a maternity hospital and a detailed report of 71 patients having chronic inflammatory disease of the pelvic organs who were treated with the Thermo-Flo in the department of obstetrics and gynecology of a university hospital.

The maternity hospital reported its results with the Newman Thermo-Flo as follows:

Summary of results with the Thermo-Flo Machine in cases of:

- I. Acute salpingitis—gonorrheal in origin.
- II. Subacute salpingitis—gonorrheal in origin.
- III. Chronic salpingitis: A—with small palpable mass.  
B—with large palpable mass.
- IV. Subacute pelvic cellulitis—postpartum and postabortal probably streptococcal in origin.
- V. Chronic pelvic cellulitis—postpartum and postabortal in origin.
- VI. Endometriosis.

The following table summarizes the results obtained: (The Roman numerals in the chart correspond to those used in the preceding table.)

Diagnosis	No. of Cases	Good		Fair		Poor		Satisfactory per Cent, Surgery	
		No.	Per Cent	No.	Per Cent	No.	Per Cent	Good or Fair	Per Cent
I	33	12	36.3	13	39.3	8	24.4	75.6	0
II	21	5	23.8	6	28.6	10	47.6	52.4	9.5
IIIA	189	72	38.1	86	45.5	31	16.4	83.6	15.3
IIIB	114	24	21.2	48	42.1	42	36.7	63.3	7.9
IV	10	2	20.0	3	30.0	5	50.0	50.0	0
V	23	4	17.4	12	52.2	7	30.4	69.6	17.2
VI	12	0	0	0	0	12	100.0	0	100.0
Total	402	119	29.6	168	42.0	115	28.4	71.6	13.0

The report from the university hospital contained the following data:

## Results

## Group 1

Chronic bilateral salpingo-oophoritis—39 cases

Complete cure	6
Marked improvement	25
Moderate improvement	5
Slight or no improvement	3

Three patients in this group became pregnant after the treatments were completed.

## Group 2

Chronic bilateral salpingo-oophoritis with unilateral or bilateral tubo-ovarian masses—13 cases

Complete cure	0
Marked improvement	10
Moderate improvement	1
Slight or no improvement	2

## Group 3

Postoperative residual pelvic inflammatory disease—7 cases

Complete cure	1
Marked improvement	5
Moderate improvement	0
Slight or no improvement	1

## Group 4

Chronic parametritis—7 cases. (4 postabortalive, 2 postpartum, 1 postoperative.)

Complete cure	1
Marked improvement	5
Moderate improvement	1
Slight or no improvement	5

## Group 5

Chronic pelvic inflammatory disease (frozen pelvis)—5 cases

Complete cure	0
Marked improvement	4
Moderate improvement	1
Slight or no improvement	0

One patient in this group became pregnant after the treatments were completed.

## Summary of Results

Complete cure	57 cases (80.3%)
Marked improvement (included with cases of "complete cure")	
Moderate improvement	8 cases (11.3%)
Slight or no improvement	6 cases (8.4%)

(Interpretation of terms):

Complete cure: Symptomatic and anatomic cure.

Marked improvement: Complete disappearance of symptoms with definite anatomic improvements.

Moderate improvement: Symptomatic improvement with little anatomic regression.

Slight or no improvement: Slight or no improvement either symptomatically or anatomically.

A detailed description of each of the 71 cases was given in the report.

The apparatus was investigated clinically by the Council, and it was found to be satisfactory from the treatment standpoint. The thermostat seemed to control the air temperatures quite well; at any one setting the temperature of the air in the applicator remained stable. The operating temperature is read on the thermometer in the applicator extending into the bag and is regulated by means of the thermostat on the panel.

The Council voted to accept the Newman Thermo-Flo for inclusion on its list of accepted devices.

## Council on Pharmacy and Chemistry

## REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.  
OFFICE OF THE COUNCIL.

## CYCLOPROPANE

In 1939 the Council published a report<sup>1</sup> of its consideration of cyclopropane without special reference to any particular brand. On the basis of the evidence available at that time it was pointed out that the gas is a suitable anesthetic agent when used cautiously by those fully informed of its properties, potential dangers and signs which indicate the stages of anesthesia with the agent. It was emphasized that unusual cardiac effects (arrhythmias) are encountered with cyclopropane, that high concentrations of the gas and its combination with sympathomimetic or other drugs which increase such irregularities are to be avoided and that it is therefore essential to watch the pulse carefully during administration. It was further pointed out that the signs to indicate the depth of anesthesia differ from those of Guedel for other anesthetic agents and that, since the respiratory center is not stimulated by cyclopropane, premedication which affects the respiratory rate should be used with caution because these signs may be further obscured by too large doses. It was indicated that, except for difficulty in detecting the plane of anesthesia by those unfamiliar with the agent, the lack of respiratory stimulation and the tendency to produce cardiac arrhythmias and postanesthetic headache, the gas possesses the advantages of decreased pulmonary irritation, effectiveness in concentrations which provide abundant oxygen, less excitement during induction and low toxicity. From the standpoint of chemical and

1. The present Status of Cyclopropane, J. A. M. A. 112:1064 (March 8) 1939.



physical properties, it was indicated that cyclopropane has the same potential danger of explosibility as the more commonly used ethyl ether.

Since the previous report of the Council was published, additional clinical and pharmacologic studies of cyclopropane have appeared in the literature.<sup>2</sup>

In general, this further evidence does not alter the previous conclusions of the Council concerning this anesthetic agent. In view of the accumulation of favorable published evidence for the use of cyclopropane as an inhalation anesthetic, the Council was about to give further consideration to a submitted brand of the gas for anesthesia with a view to acceptance when recently reported deaths from explosions of the gas caused the Council to hold acceptance in abeyance pending further investigation of the factors responsible for explosions which have occurred. In the interim cyclopropane had received official recognition under standards included in the U. S. Pharmacopeia (XI, 1939, Second Supplement).

In proceeding with its investigation into the cause of the explosions which have occurred with cyclopropane, the Council recalled that ten years ago a report by Henderson<sup>3</sup> under the auspices of the Committee on Anesthesia Accidents of the American Medical Association pointed out that explosions of anesthetic mixtures do not occur unless fired, and that precautions to avoid electrostatic discharges and other potential ignition factors must be taken. The Council also considered the incidence of anesthetic explosions which has been reported by Woodbridge<sup>4</sup> for ether, ethylene and cyclopropane. This investigator tabulated the results obtained from a questionnaire answered by eighty-seven specialists in anesthesia. The author made no attempt to include all reported explosions in order to secure a representative, unbiased sampling. The explosion rates for these anesthetic agents were found to be respectively 1.73, 2.44 and 3.85 per hundred thousand administrations, but the standard deviations due to chance are of such magnitude that the differences between the rates reported are of no significance. The explosion mortality was found to be only two (one, cyclopropane) for the entire 2½ million cases tabulated.

From information furnished by a consultant of the Council, some of the explosions with cyclopropane which have occurred since its previous report was published (March 8, 1939) are listed in table 1. It should be noted that the list includes five fatalities and does not agree with the Woodbridge<sup>4</sup> report, in which no attempt was made to include all reported explosions. Previously a note in THE JOURNAL<sup>5</sup> indicated that the

number of explosions from mixtures of anesthetic gases listed in an excerpt of the report of the Subcommittee on Fires and Explosions of the American Society of Anesthetists, Inc.,<sup>6</sup> probably did not represent all such explosions that have taken place. Study of the available details of the explosions listed in table 1 revealed that those occurring at the University of Michigan and the University of Minnesota had two features in common: the nurse was wearing rubber gloves and the patient was covered with a woolen blanket. The Michigan explosion occurred during the administration of cyclopropane and oxygen diluted with about 50 per cent helium, whereas the Minnesota explosion occurred with a mixture of cyclopro-

TABLE 1.—Cyclopropane Explosions

Place	Time	Outcome
1. Roosevelt Hospital, New York City	March 1939	Patient died
2. Hartford Hospital, Hartford, Conn	Spring 1939	Patient died
3. Emmanuel Hospital, Omaha.....	May 12, 1939	Patient died
4. University of Michigan, Ann Arbor, Mich.....	November 1939	Machine damaged
5. University of Minnesota Hospital Minneapolis.....	January 1940	Patient died
6. Sloane Hospital for Women, New York.....	April 1940	Patient died

pane, oxygen and ether. In the former instance the nonfatal nature of the explosion was attributed to the possibility that the inert gas helium had reduced the force of the explosion. In both instances the production of static electricity was regarded as the immediate cause.

Consideration was also given to reports concerning the use of so-called inert gases as diluents of anesthetic mixtures to eliminate explosive concentrations and of methods employed to avoid conditions conducive to the discharge of static sparks. A report of the U. S. Department of the Interior by Jones, Kennedy and Thomas<sup>7</sup> presents data obtained with an

2. These were reported by:  
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explosion-tube apparatus to determine the inflammability of cyclopropane-air-carbon dioxide, nitrogen and helium mixtures, and cyclopropane-oxygen-helium mixtures.

By trial and error the limits of inflammability of the prepared mixtures were determined and averages taken of those mixtures that just propagated and those that just failed to propagate flame. The data obtained for the cyclopropane-air-(nitrogen, helium, carbon dioxide) mixtures show that at least 13.4 volumes of nitrogen are required per volume of cyclopropane to render all mixtures of these gases noninflammable as compared with 14.8 volumes of helium and only 8.0 volumes of carbon dioxide. Although carbon dioxide is thus shown to be superior as a diluent in the prevention of cyclopropane explosions, the authors point out that this obviously cannot be employed in cyclopropane-oxygen anesthetic mixtures because the high concentration required to eliminate explosive hazards of this mixture would produce marked physiologic effects on patients breathing such mixtures. Helium is indicated as the diluent of choice because it is a light gas which can be breathed with less effort than nitrogen, to compensate somewhat for the lowered oxygen content of proposed mixtures, and because gaseous mixtures containing helium are more difficult to ignite by electric discharges than mixtures containing similar percentages of other inert gases. The data presented for the

TABLE 2.—Promising Mixtures

Mixture No.	Composition, per Cent by Volume		
	Cyclopropane	Oxygen	Helium
1.....	15	20	65
2.....	20	20	60
3.....	25	25	50
4.....	30	30	40

cyclopropane-oxygen-helium mixtures indicate that all mixtures containing 3 to 60 per cent cyclopropane may be used safely. Those mixtures which appear to offer the most promise for anesthetic use are given in table 2.

The authors point out that the mask, the apparatus and the patient's lungs will contain explosive mixtures for a very short period both at the beginning and at the end of the administration of the anesthetic and that, while the method of admixture with inert gas eliminates the violently explosive mixtures that usually are present through the anesthesia process, the proper procedure has yet to be worked out for administering cyclopropane-oxygen-helium mixtures so that explosive mixtures will not be present in the equipment at any time. It is indicated that an extensive program of chemical experiments with nonexplosive mixtures of gaseous combustible anesthetics is in progress. Haas, Hibshman and Romberger<sup>8</sup> have reported similar studies and, on the basis that nitrogen is a satisfactory, readily available diluent gas to render cyclopropane-oxygen anesthetic mixtures nonexplosive, have proposed the use of cyclopropane-air-oxygen for anesthesia by means of an air bulb attachment to the breathing bag for the introduction of air into closed anesthetic machines. At the nineteenth annual meeting of the Congress of Anesthetists held in Chicago, Oct. 21-25, 1940, reports by these and the foregoing investigators included tentative methods for the clinical use of nonexplosive mixtures of cyclopropane. The development of a device for anesthetic machines to detect the presence of explosive concentrations during administration was suggested.

More recently Horton<sup>9</sup> has reported a study of mixtures comprising two anesthetic gases. He is of the opinion that the explosion hazard may be reduced by using mixtures containing cyclopropane, ethylene and oxygen in proper combination. The addition of a fourth gas, such as nitrogen, helium or hydrogen, has been shown to increase the nonexplosive range even further. The use of flame barriers in anesthetic machines to prevent explosion pressures from reaching the patient has been proposed as a third measure to minimize the

explosion hazard of anesthetic gases. Evidence that such barriers are feasible has not as yet been offered.

To avoid conditions conducive to the discharge of static sparks it is necessary to have all objects and people in the operating room at the same electrical potential. An advance in this direction has been made by Horton<sup>9</sup> in designing the Horton intercoupler, a high resistance coupling device with five terminals to maintain the same electrostatic potential between any five bodies. The use of high resistance intercoupling is based on the previous report by Woodbridge, Horton and Connell.<sup>10</sup> The problem of static electricity is resolved to the elimination of nonconductors between anesthetic machines and operating room tables and floors and the patient and personnel to dissipate electrostatic charges as rapidly as these develop.

It should be kept in mind that the use of diluent gases to eliminate explosive anesthetic mixtures is limited by the extent to which the oxygen concentration of such mixtures may be reduced without interference with physiologic requirements. From the standpoint of explosion, hydrogen should not be regarded as an inert gas. It is further pointed out that nitrous oxide as well as oxygen supports combustion and therefore that, while a nitrous oxide-oxygen anesthetic mixture alone is relatively safe from the standpoint of explosion, it should not be regarded as a safeguard against this hazard when combined with ether, ethylene or cyclopropane. It should be emphasized that with the exception of nitrous oxide anesthesia the explosive potentialities of anesthetic mixtures of cyclopropane are not greater than those of other commonly employed anesthetics and that precautions to avoid this hazard are the same for all other inflammable anesthetic agents. The use of intercouplers or other means to avoid conditions favoring the discharge of static sparks may be an added hazard unless constant vigilance is applied to the proper technic of their use and the control of all other related factors. It is further emphasized that the Council does not, by this report, recognize the use of any specific mixture of gases in the administration of cyclopropane. The use of diluent gases to eliminate explosive anesthetic mixtures of cyclopropane or other anesthetic agents is in the experimental stage and should not take precedence over proper measures to eliminate all ignition factors.

After further consideration, the Council decided that explosions with cyclopropane are not primarily due to chemical or physical peculiarities of the gas itself but, as with other anesthetic agents, are directly attributable to accidental ignition, the conditions conducive to which may be avoided by observance of the necessary precautions. In view of this and the recent advances made toward the elimination of explosive anesthetic mixtures, it was voted that cyclopropane be accepted with all necessary safeguards.

### CYCLOPROPANE FOR ANESTHESIA (Ohio Chemical & Mfg. Co.)

The Ohio Chemical and Manufacturing Company was first to submit a brand of cyclopropane for the consideration of the Council. A preliminary report of its consideration of this brand was published in 1936.<sup>1</sup> At that time the Council voted to defer further consideration of the agent until more evidence of its usefulness was available.

Subsequently, with the accumulation of the additional clinical and pharmacologic evidence considered in the further report of the Council on the gas published in 1939 without reference to particular brands, it was voted to accept the manufacturer's brand of cyclopropane provided it emphasize in its advertising that the product be employed only by those who are thoroughly familiar with the anesthetic agent and include an adequate description of the cardiac arrhythmias encountered with its use and a cautionary statement to avoid the simultaneous use of epinephrine or related substances.

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9. Horton, J. W.: Hazards in the Use of Explosive Anesthetics, *Bull. Am. Assn. Nurse Anesthetists* 8:285 (Nov.) 1940.

10. Woodbridge, P. D.; Horton, J. W., and Connell, Karl: Prevention of Ignition of Anesthetic Gases by Static Spark, *J. A. M. A.* 113:740 (Aug. 26) 1939.

1. Cyclopropane for Anesthesia (Ohio Chemical & Mfg. Co.), *J. A. M. A.* 106:292 (Jan. 25) 1936.

The Ohio Chemical & Manufacturing Company was asked if it wished to have its brand of cyclopropane reconsidered by the Council under these conditions. The company indicated its desire to have the product reconsidered and submitted its current advertising. The manufacturer stated that this brand of cyclopropane is now prepared in conformance to official standards for the gas which had become available in the U. S. Pharmacopeia (XI, 1939, Second Supplement). The advertising was found to require some revision. Accordingly, the Council was about to recommend acceptance of the product when recent explosions with the gas caused the Council to hold acceptance in abeyance pending investigation into the factors responsible for these accidents. The Council voted, however, to give further consideration to the manufacturer's brand of the gas provided it agreed to revise its advertising and the product was found to conform to the official standards.

The manufacturer was notified of this action of the Council and replied that steps were being taken to devise means to avoid the explosion hazard through the development of methods to eliminate the causative factors. The company indicated that the problem was being approached from two angles—(1) the use of inert gas to eliminate explosive concentration of oxygen in cyclopropane anesthesia and (2) the avoidance of conditions conducive to the discharge of static sparks. The manufacturer submitted revised advertising but offered to withhold printing of this pending the favorable outcome of methods developed to eliminate the explosion hazard.

After further consideration of evidence submitted by the manufacturer and the reports in the literature, the Council decided that the explosion hazard of cyclopropane is not due to peculiarities of the gas itself but, as with other anesthetic agents, is directly attributable to accidental ignition, the conditions conducive to which may be avoided by observance of the necessary precautions. In view of this and the recent advances made toward the elimination of explosive anesthetic mixtures through the use of diluent gases, the Council voted to recognize cyclopropane as an anesthetic agent if used with all necessary safeguards.

In accordance with its decision to accept cyclopropane, the Council has given further consideration to the manufacturer's product. The submitted advertising is found to require only slight further revision. The cooperative attitude of the concern was commended. The Council voted to accept the brand Cyclopropane for Anesthesia (Ohio Chemical & Mfg. Co.) provided advertising is further revised as indicated and the product is found to conform to the standards of the U. S. Pharmacopeia.

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

OFFICE OF THE COUNCIL.

**CYCLOPROPANE.**—Cyclopropanum.—Trimethylene.— $C_3H_6$ .—"Contains not less than 99 per cent by volume of  $CH_2.CH_2.CH_2$ ."—U. S. P.

For standards see the U. S. Pharmacopeia under Cyclopropanum.

**Caution.**—Cyclopropane is inflammable and its mixture with oxygen or air will explode when brought in contact with a flame or an electric spark.

**Actions and Uses.**—Cyclopropane differs from other gaseous anesthetic agents in that the anesthetic-oxygen ratio is reversed—15 per cent of cyclopropane to 85 per cent of oxygen up to the rarely and briefly used 40 per cent of cyclopropane and 60 per cent oxygen. The high anesthetic potency of cyclopropane as compared with other hydrocarbons makes its use advantageous from the standpoint that abundant concentrations of oxygen may be used. There is evidence to indicate that the rate of diffusion of cyclopropane is about twice that of ethylene. Cyclopropane is eliminated less rapidly than ethylene but much faster than ether. Induction and recovery with cyclopropane are therefore slower than with ethylene but more rapid than with ether.

There is some evidence to indicate that cyclopropane affects the autonomic tissue of the heart more than ether or chloroform. In high concentrations it heightens the irritability of this tissue and predisposes to the occurrence of cardiac arrhythmias. This effect has been shown to be enhanced with the simultaneous use of epinephrine. For these reasons the pulse must be carefully observed and the use of sympathomimetic drugs avoided during cyclopropane anesthesia. Cyclopropane does not stimulate respiration as do many other general anesthetic agents, and for this reason preoperative sedation with respiratory depressants must be used with caution. The signs of Guedel for other anesthetic agents do not apply to cyclopropane, so that familiarity with the signs of the stages of anesthesia for cyclopropane is absolutely essential in the administration of this agent.

The explosibility of cyclopropane-oxygen mixtures is not greater than that of other anesthetic-oxygen mixtures with the exception of nitrous oxide, but, since the latter gas also supports combustion, its use with cyclopropane should not be regarded as a safeguard against this hazard. Careful operating room technic to avoid conditions conducive to the production of electrostatic sparks and the presence of open flames and the caution should be observed with the same precautions as those for other anesthetics.

The advantages of cyclopropane consist in its effectiveness in concentrations providing an adequate supply of oxygen, decreased pulmonary irritation, less excitement during induction and low toxicity. Its disadvantages include lack of respiratory stimulation, difficulty in detection of the planes of anesthesia by those unfamiliar in its administration, and tendency to produce cardiac arrhythmias and postanesthetic headache.

**Dosage.**—Cyclopropane is usually furnished in compressed form in metal containers. In use the gas is passed into an inhalation apparatus of the closed circuit type and is then administered by inhalation from a rebreathing bag, usually with the admixture of oxygen. The concentration employed varies from 15 to 40 per cent and with the individual patient but should probably not exceed 30 per cent. The remainder of the mixture should consist of a minimum of 20 per cent oxygen, but this should be supplied in quantities adequate for physiologic needs. When other anesthetics are used in combination or when premedication has been employed, less cyclopropane is required.

**SOLUTION LIVER EXTRACT-LILLY.**—A sterile aqueous solution containing the nitrogenous nonprotein fraction G of Cohn et al. preserved with 0.5 per cent phenol. The potency of the preparation is such that its daily parenteral administration has been found to produce the standard reticulocyte response defined for each U. S. P. unit (injectable) present, when assayed in cases of pernicious anemia as required by the Council.

**Actions and Uses.**—Solution liver extract-Lilly is proposed for intramuscular injection in the treatment of pernicious anemia. See preceding article, Liver and Stomach Preparations.

**Dosage.**—In the average uncomplicated case of pernicious anemia in relapse a satisfactory response may be obtained with an initial dose of 5 to 20 U. S. P. units (injectable) daily for the first two or three days, after which weekly injections of 7 to 15 U. S. P. units (injectable) should be continued until the blood picture has returned to normal.

For maintenance of the average uncomplicated case after the normal picture has been established, a minimum of 1 U. S. P. unit (injectable) daily is usually sufficient and may be given as a cumulative dose. Patients exhibiting extensive neurologic involvement or other degenerative changes often require more than this average dose.

Manufactured by Eli Lilly & Co., Indianapolis. No U. S. patent or trademark.

**Solution Liver Extract-Lilly, 2 U. S. P. Units per cc., 3.5 cc.:** Marketed in rubber stoppered ampules for parenteral administration.

**Solution Liver Extract-Lilly, 2 U. S. P. Units per cc., 10 cc.:** Marketed in rubber stoppered ampules for parenteral administration.

**Solution Liver Extract-Lilly, 1 U. S. P. Unit per cc., 10 cc.:** Marketed in rubber stoppered ampules for parenteral administration.

Solution liver extract-Lilly is prepared from liver extract-Lilly. One batch of this powder is dissolved in water, the solution is filtered and 0.5 per cent phenol is added as a preservative. Another batch of the powder is treated with ammonium sulfate and alcohol to remove much of the total solids. This more highly potent material is then also made up in the form of a water solution, and 0.5 per cent phenol is added. The two different solutions thus obtained from separate batches of the powder are then mixed to obtain a solution with a potency of 2 U. S. P. injectable units per cubic centimeter. Products of lower potency are prepared by adding water to the final product.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, MAY 31, 1941

## TRAUMA AND STRAIN IN RELATION TO POLIOMYELITIS

The widespread dissemination of the virus of poliomyelitis, when contrasted with the relatively limited incidence of the disease, suggests the existence of a number of contributing causative factors besides the virus. Isolated reports of the effects of either trauma or strain as predisposing factors in the development of acute anterior poliomyelitis are not infrequent. Frey<sup>1</sup> reported two cases following fractures in children 3 years old and one in a girl of 14 following the removal of a small chondroma from the left humerus. The disease developed within one month, two and one-half months and one and three-fourths months, respectively. The flaccid paralysis in each case corresponded to the seat of the trauma and to the same spinal cord segment. Zenke<sup>2</sup> reported three cases following trauma. The flaccid paralysis in her cases likewise involved muscle groups corresponding to the spinal cord segments originally involved in the trauma. Both authors believe that functional damage to the corresponding segment of the anterior horn ganglion cells acted as the predisposing factor. Bodily overexertion has recently been accorded particular attention as a possible predisposing cause. Thus, Voss<sup>3</sup> reported the case of a girl aged 17 years who contracted acute anterior poliomyelitis of the Landry type after a strenuous tennis match. Bremer<sup>4</sup> reported the case of a student in whom the disease developed following a difficult mountain climb. The observations of de Rudder and Petersen<sup>5</sup> are particularly instructive in this connection. These authors describe two small epidemics which broke out abruptly after an athletic contest, in a boarding school located in a small rural community in southern Germany. The

boys were of the ages between 13 and 19, in the best of health and trained in athletics. Within a week after the athletic contest eleven boys came down with the disease. Another group of six boys came down with the disease following the second athletic contest a few days later. Three boys who attended the contest but did not participate in the games also developed the disease, bringing the total to twenty. Of these, 14 were abortive cases while 6 were complicated by paralyses. There were no other cases in that territory and none developed in the course of the following year. The total number of the boys in this school amounted to one hundred and seven; thus the morbidity was 20.5 per cent, which is much higher than any incidence thus far reported for any community.

Nase<sup>6</sup> reported the case of a 26 year old soldier who, in the course of exercises, fell and struck his occiput and back. The accident was not followed by any alarming symptoms, so that the next day he was able to participate in a cross-country run, at the completion of which he appeared completely exhausted. There developed vomiting and rapid rise of temperature. On admission to the hospital the following morning he was not able to sit up in bed, to turn or to move his limbs except with difficulty. There was a moderate spasm of the right arm and some spasticity on bending the neck forward. His breathing was difficult. Death took place from respiratory paralysis nine hours after admission. The necropsy revealed no injury to the brain or the spinal cord. Microscopic examination revealed characteristic perivascular infiltration, lymphocytic and leukocytic infiltration, and destruction of the ganglionic cells of the anterior horns, most pronounced in the cervical segment of the spinal cord but also present in the medulla oblongata and in the white substance. The pathologist's diagnosis was acute anterior poliomyelitis. The presence of the patellar and abdominal reflexes, the spasticity of the right arm and the absence of flaccid paralyses constitute an atypical picture. However, Foerster and other writers have described atypical forms of acute anterior poliomyelitis in which increased reflexes and spasticity of certain muscle groups were associated with flaccid paralysis of some of the extremities. Such clinical pictures were seen in the fulminant cases and were the result of ascending degeneration of the pyramidal tracts. Wickmann, in his studies of the epidemics of 1911 to 1913 in Sweden, described four main clinical types: (1) the spinal, (2) the encephalitic, (3) the meningitic and (4) Landry's paralysis. Nase's case presents a combination of the encephalitic, the meningitic and the Landry type.

Recent experimental work throws additional light on the influence of chilling and overexertion on the development of poliomyelitis. Sabin<sup>7</sup> has demonstrated that rhesus monkeys inoculated with the human virus may

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3. Voss, G.: Ein Fall von Poliomyelitis ascendens acutissima, Deutsche med. Wchnschr. 58: 1882 (Nov. 25) 1932.

4. Bremer, F. W.: Ueber das klinische Bild und die Therapie der Heine-Medinschen Krankheit beim Erwachsenen, Deutsches Arch. f. klin. Med. 173: 58 (April 20) 1932.

5. de Rudder, B., and Petersen, G. A.: Steigert körperliche Anstrengung die Disposition zu epidemischer Kinderlähme? (Eine epidemiologische Beobachtung), Klin. Wchnschr. 17: 699 (May 14) 1938.

6. Nase, H.: Poliomyelitis acuta anterior und Wehrdienstbeschädigung, München. med. Wchnschr. 88: 293 (March 14) 1941.

7. Sabin, A. B.: Progress Report to the National Foundation for Infantile Paralysis.

develop a nonparalytic or even inapparent form of poliomyelitis with typical neuronal and infiltrative lesions in the spinal cord. He further found that the virus may actually reach the lower motor areas without paralysis necessarily ensuing, provided the proper equilibrium between the host and the virus exists or is achieved before too many nerve cells are affected. These observations have led to the consideration of assigning a new role to heavy exercise in the development of paralysis. The history of heavy exercise is frequently given by patients. Sabin found that the interval between this exercise and the onset of paralysis is usually less than twenty-four hours. This short interval, Sabin believes, suggests not only that those persons were already harboring the virus in their nervous system but also that it might already have involved their medulla and spinal cord and that the exercise could be the factor which converts what might have remained an unapparent or nonparalytic type of poliomyelitis into the frankly paralytic type of the disease.

Levinson<sup>8</sup> demonstrated that monkeys immersed in cold water and compelled to swim to the point of exhaustion developed more severe paralysis than did either those which remained in their cages or those which were immersed in water at body temperature and protected from exercise and chilling.

The subject of body strain deserves particular attention in connection with military service.

#### THE SIGNIFICANCE OF MORTALITY STATISTICS

In a carefully documented discussion on mortality statistics, Van Buren<sup>1</sup> points out a number of deductions which cannot be proved by such data. Entirely too much importance and finality, he says, are attached to many crude death rates. Thus, if calculations from the crude death rates for cancer over the twenty-five year period 1911-1935 are made, one would conclude that the mortality rate had increased over 41 per cent in the last year of the time series as compared with the first year. When corrected, however, for the effect of the changing age distribution, it develops that the increase was only 14.5 per cent—an entirely different picture.

Another common mistake in interpretation of mortality figures is the utter disregard of the fact that data for the expanding death registration area do not relate to the entire country for years prior to 1933. An example of the dangers inherent in failure to recognize this fact is cited by Van Buren: A news bureau recently gave to the press a statement that deaths from a certain cause had increased in the United States from 8,959 in 1920 to 19,802 in 1938 and had therefore more than doubled. The 1920 figure, however, related to

only thirty-four states, the District of Columbia and sixteen cities in nonregistration states. The actual death rate was 10.2 per hundred thousand from this cause in 1920 and 15.2 in 1938. Obviously, the rate did not "more than double."

Similar difficulties in interpreting mortality statistics may be encountered merely because of change in classification under the International List of Causes of Death or may even be due to "fashion." Thus the rate for simple meningitis dropped continuously from 27.6 per hundred thousand in 1901 to 19.2 in 1905, while, at the same time, that for epidemic cerebrospinal meningitis rose from 5.7 to 15.0. The explanation, of course, is that there was constantly increasing care exercised by physicians to define "meningitis" as of the epidemic type. Similarly, the rate for diseases of the arteries almost doubled in these five years, owing largely to the growing practice of certifying "arteriosclerosis" instead of "old age," which latter, in turn, registered a continuously declining death rate.

Changing terms in the International List have resulted in many apparent alterations in the mortality data which do not, in fact, reflect the true picture. Thus, "endocarditis and myocarditis, unqualified, for ages 45 to 59" were transferred from the "acute endocarditis and myocarditis" title to the "other diseases of the heart" title. Since the proportion of the population in the 45 to 59 age group is steadily becoming larger, and since the terms endocarditis and myocarditis are often reported without qualification on the death certificates, these transfers assume considerable importance in their effect on the published death rates. Acute and chronic bronchitis can be cited as another title that presents difficulties with respect to comparability. The 1921 revision of the International List resulted in the transfer of the terms capillary bronchitis, cyst of bronchi and asthmatic catarrh from this rubric, while plastic bronchitis was added to it.

A classic example of misleading inferences from a time series of death rates is apparent in diseases of the coronary arteries. Death rates are available beginning with 1930, when deaths from coronary diseases were first segregated in the mortality statistics. If the figures are accepted at their face value, an astounding situation is revealed: one must conclude that in the short period of eight years the rate for this cause of death increased continuously from 8.0 per hundred thousand in 1930 to 52.0 in 1938. This abrupt rise is, of course, largely spurious. In the first place, diagnostic skill in relation to coronary diseases improved during the decade, but the chief factor in the apparent sharp increase was the growing "fashion" among physicians when clinical diagnosis was undertaken in cardiac cases to report the death as coronary occlusion, coronary thrombosis or coronary sclerosis. Thousands of deaths which prior to 1930 would have been allocated to other rubrics relating to diseases of the heart have been assigned, since 1930,

8. Levinson, S. O.: Progress Report to the National Foundation for Infantile Paralysis.

1. Van Buren, G. H.: Some Things You Can't Prove by Mortality Statistics.



to coronary disease. Factors such as Van Buren cites should lead toward the employment of extraordinary caution in the interpretation of comparative mortality statistics.

## Current Comment

### HYPOTHYROIDISM IN CHILDREN

Physicians often have difficulty in diagnosing hypothyroidism in children. One of the commonest errors is to think that mongolian idiots are cretins. Many times mongolian idiots referred by practicing physicians to children's clinics arrive with the diagnosis of cretinism. Mentally defective children are often considered to be cretins solely because of their retarded mental development and particularly if they happen to have a puzzled expression and queer physiognomy. Dwarfism, even if not accompanied by any of the stigmas of hypothyroidism, is often thought to depend on deficiency of the thyroid, probably because hypothyroidism is so well known as a cause of dwarfism. An error which has become common recently is to consider delay in the development of the centers of ossification of the epiphyses as being due to hypothyroidism. This is the outgrowth of the mistaken idea that the thyroid alone governs the maturation of the centers of ossification of the skeleton. The principal difficulty is that the physician is inclined to base the diagnosis of deficiency of thyroid on the finding of one or two suggestive signs. The paper of Wilkins and Fleischmann<sup>1</sup> which appears in this issue of *THE JOURNAL* is timely. It indicates the necessity of considering the entire clinical picture from the point of view of both functional and structural changes. Attention is drawn also to the fact that the character and extent of structural changes depend on the time of life when the deficiency occurs and the length of time it remains untreated.

### THE BRAIN AND CHOLESTEROL METABOLISM

Comparatively recently it has been established that male and female sex hormones and the vitamin D group are cholesterol derivatives. The capacity of cholesterol esters to change into liquid crystalline anisotropic fats and to be deposited in the various tissues determines the unique character of disturbances of the cholesterol metabolism in pathology and particularly in the diseases of the aorta and arteries of man. P. D. Gorizontov,<sup>1</sup> working in the First Moscow Medical Institute, produced aseptic meningoencephalitis in dogs by subdural injection into the brain of either turpentine or silver nitrate. The comparative study of the blood cholesterol of the afferent arteries of the brain and of the blood cholesterol level of the efferent vessels of the brain demonstrated the development of hypercholesteremia in the experimental animals, which could not be explained on the basis of mobilization of chole-

sterol from the lipid depots of the brain but which the author interprets as the result of the increase of cholesterol synthesis in the brain. Gorizontov correlated the various biochemical data obtained in his experiments with the morphologic alterations in the brain of his experimental animals and established the dependence of the blood cholesterol levels in his animals on the reactive processes on the part of the ectodermal neuroglia cells of the brain. This interesting and entirely new concept of the role of neuroglia in the cholesterol metabolism presents not only a theoretical but also a practical interest, since concepts in pathology thus far do not recognize humoral significance of the brain. In the light of the view advanced by the author, the role of neuroglia in cholesterol metabolism is that of a detoxifying process; toxic brain lesions themselves may be regarded as the result of disturbance of metabolic function of the neuroglia. Thus, hypercholesteremia as a result of hyperfunction of the neuroglia cells of ectodermal origin plays an important part in the lesions of internal organs, as for example in the development of atheromatosis of the aorta and of the arteries.

### PROPHYLACTIC MEASURES FOR SYPHILIS AND GONORRHEA

The medical profession and the public health agencies bear a heavy responsibility for the prevention of syphilis and gonorrhea, especially during the present period of military mobilization. Both chemical and mechanical methods of prophylaxis have been definitely proved efficacious and, if their use is widely understood and correctly applied, there should be a great diminution in the incidence of both diseases. A preliminary statement on this subject by a special joint committee appointed by the American Social Hygiene Association and the United States Public Health Service, headed by H. H. Hazen, has recently appeared.<sup>1</sup> Health education with regard to syphilis and gonorrhea should include simple frank and explicit directions as to chemical and mechanical prophylaxis and in addition involves obligation on the part of health authorities to provide the facilities through which the means recommended may be made available. The following recommendations are made:

1. Safest method:
  - A. Use a condom of standard type.
  - B. Thoroughly wash the genitals and adjacent parts with soap and water as soon as possible (the sooner the better, but within one hour at most) after removal of the condom.
2. In the absence of a condom:
  - A. Thoroughly wash with soap and hot water as already described.
  - B. After urination, inject 6 cc. of 2 per cent strong protein silver solution, or other efficient, nonirritating germicidal solution into the urethra and hold for five minutes.
  - C. Rub 33 per cent ointment of mild mercurous chloride (calomel ointment) into the genitals and adjacent parts.

The committee emphasizes the fact that these methods are not 100 per cent successful but are sufficiently successful to deserve widespread application.

1. Wilkins, Lawson, and Fleischmann, Walter: The Diagnosis of Hypothyroidism in Childhood, this issue, p. 2459.

1. Gorizontov, P. D.: The Role of the Brain in Cholesterol Metabolism: Role of Neuroglia in Pathogenesis of Cholesterinemia (in Russian), Moscow, Izdanie Pervago Moskovskogo, Meditsinskogo Instituta, 1940.

1. Hazen, H. H., et al.: The Chemical and Mechanical Prevention of Syphilis and Gonorrhea, *Venereal Disease Information* 21:311 (Oct.) 1940.



# MEDICAL PREPAREDNESS

*In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.*

## NEUROPSYCHIATRIC EXAMINATION OF APPLICANTS FOR VOLUNTARY ENLISTMENT AND SELECTEES FOR INDUCTION

### Circular Letter No. 19

1. The Surgeon General desires that medical officers examining applicants for voluntary enlistment and selectees for induction be especially alert to detect all persons with deficiency, constitutional psychopathy, prepsychotic and postpsychotic personality or psychosis and other persons who later may disrupt discipline and morale, retard progressive military training, occupy hospital beds urgently needed for acutely ill patients and finally become an economic burden on the government.

2. The following information is intended solely as a practical guide, and neuropsychiatrists are enjoined to apply it with discretion and mature judgment in order not to reject applicants or selectees without adequate and positive diagnostic indications of their unsuitability for active service, since their unwarranted rejection not only would constitute an injustice to the persons concerned but would deprive the government of their service.

3. During the period from April 1, 1917 to Dec. 31, 1919 no less than 97,657 patients were admitted to hospitals for persons with neuropsychiatric diseases. The major subclassification grouped 8,731 as hospitalized for epilepsy, 8,028 for neurasthenia, 4,310 for neurocirculatory asthenia, 6,090 for hysteria, 5,146 for constitutional psychopathic states, 13,063 for mental deficiency, 6,249 for dementia praecox, 7,501 for psychoneuroses, 5,652 for other types of psychoses and the remainder for various neuropsychiatric disorders. The foregoing brief analysis indicates the necessity of careful neuropsychiatric study of all questionable applicants on their examination at recruiting or induction stations.

4. The soldier must be looked on as a fighting unit requiring certain limited and definite qualifications. Not all persons are adaptable to restrictions and inhibitions of personal desires and comforts, to deprivation of rest, food or shelter or to the extraordinary demands for prolonged physical and mental activity often imposed by active military service. It must be remembered that many persons with abnormal personality traits who are capable of satisfactory adult adjustment in civilian life, in which numerous avenues of escape are available, will be at a total loss to adjust themselves to a pattern which is more or less inflexible and, of necessity, delimited and circumscribed as to self expression. When thrown on their own meager resources of adaptation in a military environment, in contact with all kinds of personalities, some who are just able to adapt themselves to life under the most favorable conditions will not fit into the one iron mold which experience has taught is essential to military success.

5. Applicants who manifest any of the following personality deviations require special attention on the part of the psychiatric examiner: instability, seclusiveness, sulkiness, sluggishness, discontent, lonesomeness, depression, shyness, suspicion, overboisterousness, timidity, sleeplessness, lack of initiative and ambition, personal uncleanness, stupidity, dullness, resentfulness to discipline, nocturnal incontinence, sleepwalking, recognized queerness, suicidal tendencies (bona fide or not) and homosexual proclivities.

6. A brief résumé of the more common neuropsychopathic conditions is as follows:

**GROUP I. Mental Defects and Deficiencies.**—These are manifested by a lack of general information concerning the native environment; inability to learn, to reason, to calculate, to plan, to construct, to compare weights, and so on; defect in judgment, foresight, language and output of effort; suggestibility; untidiness; lack of personal cleanliness; anatomic stigmas of degeneration, and muscular awkwardness. The history of the school life and the vocational career as well as the disciplinary report will assist materially; then the applicant should be classified according to psychometric standards.

Examiners should use extreme care and judgment in reporting their findings on the enlistment record, since these records are given to the registrants when they are rejected and become common knowledge in the community. Such terms as "imbecile" and "moron" will not be used, but an approximate psychometric scaling will be listed as the cause for rejection, such as "mental age, 8 years." Elaborate psychometric estimation is not necessary, and any accepted abbreviated method will suffice. Intelligence cannot be definitely estimated, and no infallible test is available. The results are all only approximations and must be evaluated only in conjunction with accompanying factors and circumstances.

Illiteracy per se is not to be classified as mental deficiency.

**GROUP II. Psychopathic Personality Disorders.**—Under this heading is placed an ill defined, more or less heterogeneous group of conditions in which the patients, although they do not suffer from a congenital defect in the intellectual sphere, manifest a definite defect in their ability to profit by experience. They are unable to proceed through life with any definite pattern of standardized activity. They are unable to respond in an adult social manner to the demands of honesty, truthfulness, decency and consideration of their associates. They are emotionally unstable and not to be depended on; they act impulsively, with poor judgment; they are always in difficulties, have many and various schemes without any logical basis, lack tenacity of purpose, are easily influenced and are often in conflict with the law. They do not take kindly to regimentation and are continually at variance with those who attempt to indoctrinate them in the essentials of military discipline. Such persons have a decided influence on their associates and on the morale of the organization, for they will not conform to organized authority, and they derive much satisfaction from cultivating insubordination in others. Frequently they make a favorable impression, are neat, talk well and are well mannered. However, under this veneer the real defect is evident by past irresponsiveness to social demands and lack of continuity of purpose. In this general group are to be placed many homosexual persons, grotesque and pathologic liars, vagabonds, inadequate and emotionally unstable persons, petty offenders, swindlers, kleptomaniacs, pyromaniacs, alcoholic persons and likewise those highly irritable and arrogant persons the so-called pseudoquerulents ("guardhouse lawyers"), who are forever critical of organized authority and imbued with feelings of abuse and lack of consideration by their fellows.

**GROUP III. Major Abnormalities of Mood.**—Major abnormalities of mood are shown by episodes of unreasonable elation or depression which tend to recur without obvious connection with events. Persons who are known to be so mercurial in their reactions that their judgment is seriously impaired during the upward or downward swing of their moods should be rejected. Registrants known to have received medical or nursing care because of morbid excitement or depression should be rejected.

**GROUP IV. Psychoneurotic Disorders.**—Psychoneurotic disorders present a more difficult diagnostic problem. The signs and symptoms fall more or less clearly into one of three major categories: the hysterical, physical signs and symptoms often so dramatic that they may seem fraudulent and do not follow anatomically understandable patterns; the morbidly anxious, various signs and symptoms of fear, and the obsessional, which include such varied conditions as hypochondriacal states (pre-occupation with one's ill health); morbid fears (phobias), and rituals of action and thought which the patients feel compelled to carry out.

The examiner should look for hysterical stigmas, such as cutaneous anesthesia (especially hemianesthesia); contractions of the visual fields, and so on; phobias; morbid doubts and fears; attacks of anxiety; compulsions, and hypochondriasis. He should compare the complaints with the behavior and obtain a history as to former nervous breakdowns and vocational career.

For purposes of classification, there are to be placed in this group the so-called psychosomatic disorders, mental or personality difficulties chiefly characterized by signs and symptoms of systemic disease—respiratory, gastrointestinal, cardiac, genitourinary or cutaneous. These include many examples of asthma, urticaria, "neurasthenic states," neurocirculatory asthenia, "effort syndrome," disordered action of the heart, paroxysmal tachycardia, gastric hyperacidity, pylorospasm, gastric and duodenal ulceration, spastic constipation and diarrhea, mucous colitis, impotence, urinary urgency or frequency and incontinence of semen. The examiner should look for a clear relation in the history of attacks coinciding with periods of personal stress and of improvement with separations from the accustomed stressful surroundings. These conditions sometimes appear early in the course of prepsychotic states discussed under group V.

**GROUP V. Conditions Associated with Dementia Praecox.**—This category comprises grave mental or personality handicaps. Persons with prepsychotic or postpsychotic personality and persons actually suffering from a schizophrenic ("dementia praecox") mental disorder manifest their condition by obscurely motivated peculiarities of behavior and thought. Of these, the so-called deteriorated states are the most obvious. Among such persons belong the numerous shiftless, untidy, perhaps morose, sometimes nomadic persons who have had what was regarded as a normal childhood. Somewhere between the ages of 12 and 25 they underwent a change, acute or insidious, with dilapidation of their social interests and the habits in which they had been trained. They may or may not have received treatment in hospitals for mental diseases.

Paranoiac personality traits comprise another large division. Paranoid persons cling to fantastic beliefs in their overwhelming importance and often feel that others are persecuting them or otherwise interfering with their career or their well being. Some of them believe that they are in communion with supernatural beings. Others believe that they are victims of plots, secret organizations, spy rings or religious or fraternal groups. They are often plausible in supporting these delusions by clever misinterpretation of facts. Some of them are evasive and skilful at concealing their disorder. A morbid suspiciousness of any one who takes an interest in them is frequent. They may become tense and hateful when interrogated. An attitude of unusual cautiousness or suspiciousness toward the examining physician or toward fellow registrants should suggest the possibility of paranoia.

The catatonic and prepsychotic states may present great difficulty in diagnosis. Perhaps the only obvious sign of these

conditions is the impression of queerness. The actual oddities of behavior or thought may be subtle; it may be difficult in retrospect to point to any particular instances of the unusual. The most striking signs of these conditions may, in fact, come out in connection with the physical examination. The physician at some stage of the physical examination may observe a peculiar reaction which on questioning may awaken a suspicion of a prepsychotic state. Prepsychotic persons frequently entertain unfounded convictions as to bodily peculiarities or disorders which they attribute to excessive sexual acts of one sort or another. These beliefs, sometimes hard to elicit, are often medically incredible and bizarre. Questioning such persons on intimate personal matters often leads to great embarrassment, confused speech or actual blocking of thought, so that they do not know what to say.

**Salient Deviations:** These are indifference; apathy; withdrawal from the environment; ideas of reference and persecution; feelings of the mind being tampered with or of the thoughts being controlled by hypnotic, spiritualistic or other mysterious agencies; hallucinations of hearing; bodily hallucinations, frequently electrical or sexual; meaningless smiles, and, in general, inappropriate emotional reactions and a lack of connectedness in conversation. There may be sudden emotional or motor outbursts. The examiner should get the history of the family life and of the school, vocational and personal career.

**GROUP VI. Conditions Due to Chronic Inebriety.**—As evidences of alcoholism, one should look for suffused eyes; prominent superficial blood vessels of the nose and cheek; a flabby, bloated face; red or pale purplish discoloration of the mucous membrane of the pharynx and the soft palate; muscular tremor in the protruded tongue and extended fingers; tremulous handwriting; emotionalism; prevarication; suspicion; auditory or visual hallucination, and persecutory ideas. Early inebriety, especially in young selectees with morbid addiction to alcohol, may show no objective signs. A verified history of frequent breach of the law when drunk or of hospital treatment on account of alcoholism should be regarded as disqualifying.

For drug addiction one should look for pallor and dryness of the skin. If the drug is being used, the attitude is that of flippancy and mild exhilaration; if the drug has been withdrawn, it is cowardly and cringing. During the period of withdrawal there are also restlessness, anxiety and complaints of weakness, nausea and pains in the stomach, back and legs. There is distortion of the alae nasi. The pupils are contracted by morphine and dilated by cocaine. All habitual drug takers are liars. They do not drink, as a rule, and are inactive sexually. Many drug takers use needles and show white scars on the thighs, arms and trunk. Diacetylmorphine (heroin) addicts are mostly young men from the cities, often gangsters. They have a characteristic vocabulary and will talk much more freely about the habit if the examiner in his inquiries uses such words as "deck," "quill," "package," "an eighth," "blowers" and "cokie." A verified history of arrest for violation of the narcotic law should be regarded as disqualifying.

**GROUP VII. Conditions Accompanying Syphilis of the Central Nervous System.**—One should look for anomalous reaction of the pupil, facial tremor, speech defect in test phrases and in slurring and distortion of words in conversations and writing defects consisting of omissions and distortions of words. The mood is apathetic, depressed or euphoric. There are loss of memory and discrepancies in relating the facts of life. The knee jerks may be plus, minus or normal.

**GROUP VIII. Other Organic Diseases of Brain, Spinal Cord or Peripheral Nerves.**—Certain after-effects of organic nervous disease need not be causes for rejection provided (1) the disease is no longer operative and is not likely to recur and (2) the effect left by it does not prevent a satisfactory fulfillment of military duties. Examples of such conditions are paralysis of a few unimportant muscles following poliomyelitis; slight unilateral hypertonicity resulting from infantile hemiplegia in a man now robust, and various traumatic conditions. A history of hemiplegia occurring after infancy should always disqualify, even if no symptoms remain.

Existent organic nervous disease should always disqualify for military service. For example, neuritis of one or many nerves, while capable of recovery without resultant defect, is none the less a cause for rejection as long as it exists. The following organic nervous diseases are mentioned specifically, as they are the ones which frequently present few symptoms and may pass undetected by even the most skilful examiners:

**Multiple Sclerosis:** The symptoms are intention tremor, nystagmus, absence of abdominal reflexes and increased tendon reflexes. The scanning speech may be mistaken for stammering. There is no history of pain, but sometimes there is a history of urinary disturbance.

**Progressive Muscular Atrophies and Dystrophies and Syringomyelia:** One should look for atrophies in the small muscles of the hand and in the muscles of the shoulder girdle, with fibrillary twitchings. These plus anesthesia for heat and cold (scars on the hands from cuts and burnings) suggest syringomyelia. The history usually furnishes few data, although reference may be made to awkwardness. There is no history of pain. Syphilitic spinal disease imitates these conditions closely.

**Epilepsies:** There may be deep scars on the tongue, face and head. The voice is frequently characteristic. If one has the history alone, which may include incidents called faintness, dizziness or spasms of the face or of an extremity, one should verify by correspondence with physicians if practicable.

**Hypertthyroidism:** This is a nervous disease in its effects. There are persistent tachycardia, exophthalmos, tremor and an enlarged thyroid. There is a history of general nervousness.

7. In addition to the foregoing conditions, there are certain groups of symptoms which should be carefully investigated. They may not by themselves be sufficient for an exact diagnosis, but they generally indicate that the nervous system is seriously diseased and totally undependable for any continuous service.

**General Symptoms.**—These include abnormal attitudes, postures, contractions, contractures, deformities, atrophies or hypertrophies, marked kyphosis, scoliosis or lordosis, vasomotor or trophic disturbances, abnormal bodily and facial distribution of hair and abnormal distribution of fat.

**Station and Gait.**—A spastic gait, a scissors gait, marche à petits pas, cerebellar ataxia, a grotesque, histrionic or dancing

gait, steppage, waddling, a bizarre gait, a nondescript gait (as seen in hysterical conditions), festination, propulsion, retropulsion, lateropulsion or loss or diminution of the normal automatic associated finer movements in walking may be observed.

**Abnormal Coordination.**—This is shown by the Romberg sign, cerebral and cerebellar ataxia, nonequilibrium ataxia, dysmetria and adiadosokinesis.

**Abnormal Motility.**—There may be abnormal motility of the eyes, face, mouth, neck or large joints.

**Abnormal Involuntary or Spontaneous Movements.**—Tremors, intentional or otherwise, nystagmus, fibrillation, choreic movements, athetosis or spasm may be noted.

**Abnormal Reflexes.**—Various reflex abnormalities may be present throughout the body (Babinski, Oppenheim, Gordon or Chaddock sign; grasping and groping reflexes; ankle clonus).

**Sensory Abnormalities.**—There may be hypesthesia, hyperesthesia, paresthesia, analgesia, thermesthesia, altered vibratory, joint, tendon or position sense, defective localization or defective stereognosis.

**Evidence of Pathologic Change in Cranial Nerves.**—This includes areas of tenderness over the calvarium and postencephalitic and posttraumatic syndromes.

8. The Army is one of the elements of national defense, and its present mission is one of preparation for an offensive-defensive type of warfare. It is in no sense a social service or a curative agency. It is to be considered neither a haven of rest for wanderers nor a corrective school for misfits, ne'er-dowells, feeble-minded persons or chronic offenders. Furthermore, it is neither a gymnasium for the training and development of the undernourished or undeveloped nor a psychiatric clinic for proper adjustment to adult emotional development. Therefore, there is no place within the Army for physical or mental weaklings, potentially psychotic or prepsychotic persons or behavior problems. Men who present behavior problems in the civilian community will certainly present intensified problems in the service.

9. While the aforementioned facts are brought to the examiner's attention, he is enjoined to interpret them not as a basis for lightly rejecting men for military service but rather as points on which to evaluate them with a view to eliminating the unfit and retaining those capable of satisfactorily performing the duties of soldiers.

## THE NATIONAL YOUTH ADMINISTRATION HEALTH PROGRAM

While about 80 per cent of the young people employed by the National Youth Administration are fit for any type of work, nine out of every ten have health defects, most of which can be remedied provided suitable treatment is made available, according to preliminary statistics compiled under the health program of the National Youth Administration.

These figures are based on the results of medical examinations of ten thousand NYA workers made by local practicing doctors and dentists who have been employed by the National Youth Administration to do this work. The records tabulated to date reflect the health needs of youth as seen by physicians from twenty-one states representing all geographic regions of the United States.

With the cooperation of the medical profession as well as of federal and state health authorities, the National Youth Administration's health program now operates in all states. The basis of this health program, which is an important part of the defense work of this agency, is a medical examination which facilitates assignment of youth to suitable work activities and at the same time discloses to young people their need for remedial treatment.

While the primary aim of the NYA is to provide young people with basic work experience to fit them for jobs in private industry, it has a logical concern with building up the health

and physical fitness of its employees, both from the standpoint of the national welfare and as the largest employer of youth labor in the country.

### HEALTH STATUS CLASSIFICATION

Young people who have been given health examinations have been grouped into health status classifications according to their physical ability to work and to engage in athletic activity. While six groupings are actually being used, these will be condensed here into four:

Group A comprises 78 per cent of all youth examined. It represents those who are at present fit for any type of employment or athletic activity. The individuals of this group, although fit for any employment, received one hundred and thirty health recommendations for each hundred youths. The rate for females was considerably higher than for males.

Group B comprises 13 per cent of all youth examined. It represents those who have defects not thought to be amenable to correction but not severely handicapping. There were one hundred and sixty health recommendations for each hundred youths in this group.

Group C comprises 5.5 per cent of all youth examined. It represents those whose assignment to a particular job should be approved by a physician. Some require medical supervision on the job. There were two hundred and ten health recommendations for each hundred youths in group C.

1. The National Youth Administration Contributes to the National Health, J. A. M. A. 115:2185 (Dec. 21) 1940.

Group D comprises 2.5 per cent of those examined. It represents those who are temporarily or permanently unfit for any employment. There were two hundred and ninety health recommendations for each hundred youths.

#### RECOMMENDATIONS, TYPE AND AMOUNT

Dental care was recommended for 56 per cent of those examined. This is made up of recommendations made by both physicians and dentists. If dentists had been used to make the dental examination for each youth, the figure would have been considerably higher, since among youth examined by dentists 72 per cent were reported as having carious teeth, while physicians reported only 47 per cent.

It is of interest that, in 10 per cent of the youth, each had from ten to thirty decayed teeth.

Tonsillectomy was recommended for 15 per cent.

Refraction was recommended for 15 per cent.

Special diets were recommended for 10 per cent.

Minor surgery, including hemorrhoidectomies and circumcisions, was recommended for 6 per cent.

Veneral disease treatment was recommended for 2 per cent. If a youth is already under treatment for a venereal disease, many physicians do not recommend treatment in this type of examination, although they do note presence of the disease.

Major surgery, including hernia repair, was recommended for 2 per cent.

Hookworm treatment was recommended for 2 per cent. Considering youth from the Southern states only, treatment for hookworm disease and hookworm infection was recommended for 5 per cent.

#### OTHER FINDINGS

Slightly over 5 per cent were described as being malnourished, while obesity was present in 3 per cent.

Organic heart disease was reported in almost 3 per cent of those examined.

In this first group to be reported, tuberculin testing and chest roentgenograms had not been completed; however, the finding

of 95 cases of pulmonary tuberculosis were reported, of which 26 were active.

One of the most significant results of these examinations as far as the medical profession is concerned is the revelation that 25 per cent of the youths examined reported they had never been to a dentist and 18 per cent reported that they had never been to a physician. This disclosure is especially meaningful when one remembers that this is a group of young people who have been out of our public schools only a short time and presents a real challenge to those interested in health education and the application of preventive medicine.

The eight leading health defects for which corrections have been recommended can largely be taken care of in clinics or offices of physicians and dentists. Only a small group need hospitalization. Most of the health defects noted do not affect, at this early age, the ability of approximately 80 per cent of these youths to work, but many of the defects will influence unfavorably the selection of many youths by private industry and will, at a slightly later stage in life, decidedly affect the efficiency of the individual on any job, as well as eligibility for military service.

One of the main contributions of the NYA in obtaining treatment for young people who need it has been the payment of a wage to its youth employees which has enabled many to pay the cost of medical and dental care. NYA has placed many young people in contact with practicing physicians and dentists and has encouraged special private arrangements between the youth and the physician for defraying the cost of professional services. Where public or private clinics exist, it has been possible to facilitate access to these agencies for a sizable group of young people.

On the basis of experience thus far, it is believed that about 50 per cent of the NYA youth can be provided with needed health service through some such arrangements, depending on geographic locations. The remaining group of youth present a problem for which there is no present solution.

## ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ANDERSON, Milford Xerxes, 1st Lieut., Los Angeles.  
ARNESON, Charles Albert, Captain, Fargo, N. D.  
AXELROD, Harold, 1st Lieut., Brooklyn.  
BAKER, Norman Ludlow, 1st Lieut., Chicago.  
BALL, George Lindsay, Captain, Washington, D. C.  
BARRETT, Richard Henry, 1st Lieut., Rochester, Minn.  
BARTLETT, Walter Merritt, 1st Lieut., Benton Harbor, Mich.  
BEERNINK, Ernest Henry, Captain, Grand Haven, Mich.  
BERMAN, Leonard Stanley, 1st Lieut., Washington, D. C.  
BISHOP, Harold Francis, 1st Lieut., Valhalla, N. Y.  
BOSS, Myron Theodore, 1st Lieut., Baltimore.  
BROWN, Charles Howard, 1st Lieut., Beverly Hills, Calif.  
BURFORD, Edgar Humber, Captain, St. Louis.  
BURRAGE, William Champlin, 1st Lieut., Boston.  
CHALLMAN, Samuel Alan, Captain, Minneapolis.  
DAVIS, Fenimore Edison, Captain, Ann Arbor, Mich.  
DELEHANTY, John Thomas, 1st Lieut., Lattimer, Luzerne County, Pa.  
FIENBERG, Robert A., 1st Lieut., Westfield, Mass.  
FISHER, Roy Lee, Captain, Frederick, Okla.  
FRENCH, Adam James, 1st Lieut., Ann Arbor, Mich.  
GOLDBERG, Solomon, Captain, Pittsburgh.  
HARWELL, Carl Mallory, Jr., 1st Lieut., Memphis, Tenn.

#### FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Massachusetts, Rhode Island and Connecticut:

ALLEN, Howard H., 1st Lieut., Greensboro, Vt., Fort Devens, Mass.  
ANDERSON, Donald L., 1st Lieut., Caribou, Maine, Fort Devens, Mass.  
ANDERSON, Fred A., 1st Lieut., West Roxbury, Mass., Fort Devens, Mass.  
ANTOS, Chester J., 1st Lieut., Salem, Mass., Fort Devens, Mass.  
ARCHAMBAULT, Rene F., Captain, Barre, Vt., Fort Devens, Mass.  
BARD, Henry H., Captain, Pittsfield, Mass., Camp Edwards, Mass.  
BARRETT, Charles G., Captain, Amherst, Mass., Fort Devens, Mass.

ISLER, Nathaniel Charles, Captain, Jeffersonville, Ind.  
KING, Albert Terrence, 1st Lieut., Salem, Ore.  
KREFT, Alfred John, 1st Lieut., Des Plaines, Ill.  
KROTCHER, Lester Clayton, Captain, Twin Falls, Idaho.  
LEA, Joseph Davis, 1st Lieut., New Orleans.  
LEFFINGWELL, Forrest Emmett, Captain, Montebello, Calif.  
McLOUGHLIN, Christopher John, 1st Lieut., Rochester, Minn.  
MALTRY, Emile, Jr., 1st Lieut., New Orleans.  
MILLER, Samuel Lewis, Captain, Cheboygan, Mich.  
NACHTMAN, Howard Frank, 1st Lieut., Portland, Ore.  
NEIBRIEF, Milton Nelson, 1st Lieut., Brooklyn.  
NOONAN, Thomas Robert, 1st Lieut., Rochester, N. Y.  
PLUM, John Bernard, 1st Lieut., Grand Rapids, Mich.  
POWERS, Pierce William, 1st Lieut., St. Louis.  
REEVES, David Lander, Captain, Los Angeles.  
RICE, Dale Arthur, 1st Lieut., Meadville, Pa.  
SEID, Sidney E., Captain, Chillicothe, Okla.  
SMITH, Eugene, 1st Lieut., Waterloo, Iowa.  
SPENCER, Newton Carman, Major, Toledo, Ohio.  
STADLER, Harold Erwin, 1st Lieut., Iowa City.  
SUGAR, Samuel Jacob Nathan, 1st Lieut., Washington, D. C.  
TANNER, Henry Seiver, 1st Lieut., Indianapolis.  
THATCHER, Donald Sheldon, 1st Lieut., Milwaukee.  
WHITEHEAD, Duncan, Captain, Leominster, Mass.  
WOLPAW, Sidney Elmer, 1st Lieut., Cleveland Heights, Ohio.  
YOUNG, John D., Jr., 1st Lieut., Lexington, Ky.

BOTTAMINI, Joseph T., 1st Lieut., Burlington, Vt., Fort Devens, Mass.  
BROWE, John H., 1st Lieut., Hartford, Conn., Fort Williams, Maine.  
BURGIN, Leo B., Captain, Brookline, Mass., Fort Devens, Mass.  
BUTTLES, Roy V., 1st Lieut., Burlington, Vt., Fort Devens, Mass.  
CAHILL, Francis P., 1st Lieut., Cambridge, Mass., Manchester, N. H.  
CAMPBELL, Kenneth D., 1st Lieut., Somerville, Mass., Manchester, N. H.  
CASE, Edward P., Lieut. Col., West Hartford, Conn., Fort Adams, R. I.  
CHOATE, Paul M., 1st Lieut., West Barnet, Vt., Fort Devens, Mass.  
CLARK, Benjamin F., Captain, St. Johnsbury, Vt., Fort Devens, Mass.  
CLEMENT, Howard R., 1st Lieut., Boston, Camp Edwards, Mass.  
CURTIS, Sprague, 1st Lieut., Westfield, Mass., Fort Devens, Mass.  
DENNING, Walter S., 1st Lieut., Brookline, Mass., Fort Devens, Mass.  
DeVOLT, Reginald F., 1st Lieut., Plymouth, N. H., Fort Devens, Mass.  
EASTMAN, Cyrus D., 1st Lieut., Monroe, N. H., Fort Devens, Mass.

ESTABROOK, John S., 1st Lieut., Brandon, Vt., Fort Devens, Mass.  
FINKS, Henry, 1st Lieut., Portland, Maine, Bangor, Maine.  
FROMER, John L., Captain, Brookline, Mass., Fort Devens, Mass.  
GALLERY, Daniel F., 1st Lieut., Fall River, Mass., Manchester, N. H.  
GENCARELLI, Alphonse F., 1st Lieut., Hartford, Conn., Fort Devens, Mass.  
GINGOLD, Thomas L., Major, New Haven, Conn., Fort Banks, Mass.  
GLADSTONE, Arthur, 1st Lieut., Burlington, Vt., Bangor, Maine.  
GODDARD, Philip A., 1st Lieut., Morrisville, Vt., Bangor, Maine.  
GOERGEN, William F., 1st Lieut., Danbury, Conn., Bangor, Maine.  
GOLDSBERRY, John J., 1st Lieut., Worcester, Mass., Fort Dix, N. J.  
GOODRICH, William, 1st Lieut., Bridgeport, Conn., Fort Devens, Mass.  
HAMMER, Joseph, 1st Lieut., Wellesley, Mass., Bangor, Maine.  
HARWOOD, Clarence W., 1st Lieut., Burlington, Vt., Fort Devens, Mass.  
HARWOOD, Clifford B., 1st Lieut., Whitingham, Vt., Fort Devens, Mass.  
HERSEY, Thomas F., 1st Lieut., Hamden, Conn., Fort Devens, Mass.  
HOBBS, Milford L., 1st Lieut., Burlington, Vt., Camp Edwards, Mass.  
ISENSTEIN, Charles, 1st Lieut., Dorchester, Mass., Camp Edwards, Mass.  
JORESS, Mark H., 1st Lieut., Lynn, Mass., Camp Edwards, Mass.  
LAKE, Fredric D., 1st Lieut., Springfield, Mass., Fort Devens, Mass.  
LEVIN, Harold M., 1st Lieut., Burlington, Vt., Bangor, Maine.

LEVIN, Spencer E., Captain, Roxbury, Mass., Fort Devens, Mass.  
LEVINE, David I., 1st Lieut., Weymouth, Mass., Camp Edwards, Mass.  
MAHONEY, James P., 1st Lieut., Burlington, Vt., Fort Devens, Mass.  
MELLION, Jacob, Captain, New Britain, Conn., Camp Edwards, Mass.  
MERRIAM, Philip G., 1st Lieut., New Britain, Conn., Fort Devens, Mass.  
MILLSTEIN, Hyman, 1st Lieut., Southwest Harbor, Maine, Fort Devens, Mass.  
MONROE, Willys M., Major, Pittsfield, Mass., Camp Edwards, Mass.  
MONTGOMERY, Eugene P., 1st Lieut., Boston, Camp Langdon, N. H.  
PERLEY, John R., 1st Lieut., Lakeport, N. H., Fort Devens, Mass.  
RABNOWITZ, Henry, 1st Lieut., Brockton, Mass., Camp Edwards, Mass.  
RADCLIFFE, Ernest J., Captain, Amherst, Mass., Bangor, Maine.  
SKELTON, Alton B., 1st Lieut., Winchendon, Mass., Camp Edwards, Mass.  
SMITH, Joseph, Captain, Providence, R. I., Manchester, N. H.  
TIMMERMAN, Frederick W., 1st Lieut., Morrisville, Vt., Fort Devens, Mass.  
TUCKER, Arthur S., 1st Lieut., New Haven, Conn., Camp Edwards, Mass.  
TUOHY, Edward L., 1st Lieut., Cambridge, Mass., Camp Edwards, Mass.  
TWADELLE, Frank J., 1st Lieut., Wellesley, Mass., Camp Edwards, Mass.

## FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

ANTONAKOS, Theodore, 1st Lieut., Winston-Salem, N. C., MacDill Field, Fla.  
ASLING, Clarence W., 1st Lieut., Nashville, Tenn., Camp Croft, S. C.  
AUERBACH, Stewart H., Captain, Augusta, Ga., Camp Wheeler, Ga.  
BAILEY, Thomas E., 1st Lieut., Augusta, Ga., Camp Davis, N. C.  
BANNIS, John Adam, 1st Lieut., Birmingham, Ala., Fort Bragg, N. C.  
BARKOFF, Samuel A., 1st Lieut., New Orleans, MacDill Field, Fla.  
BASS, Beatty Lee, 1st Lieut., Winston-Salem, N. C., Fort Bragg, N. C.  
BLACK, Charles L., 1st Lieut., Coshatt, La., Camp Polk, La.  
BLEECKER, Philip B., 1st Lieut., Memphis, Tenn., Fort Bragg, N. C.  
BODDIE, James B., Jr., 1st Lieut., Nashville, Tenn., Fort Benning, Ga.  
BOMBET, Charles N., 1st Lieut., Baton Rouge, La., Fort Benning, Ga.  
BOSTWICK, Jackson L., 1st Lieut., Jacksonville, Fla., Fort Benning, Ga.  
BOURKARD, Ernest Richard, 1st Lieut., Miami, Fla., Camp Davis, N. C.  
BOVEN, Jack H., 1st Lieut., Jacksonville, Fla., Fort Bragg, N. C.  
BRANNEN, Frank S., 1st Lieut., Chattanooga, Tenn., Fort Bragg, N. C.  
BYRON, Robin Adair, 1st Lieut., New Orleans, Fort Bragg, N. C.  
CASH, Ralph Louard, 1st Lieut., New Orleans, Fort Bragg, N. C.  
CHAMBERS, John M., Jr., 1st Lieut., Memphis, Tenn., MacDill Field, Fla.  
COOLEY, Beamon S., Jr., 1st Lieut., Birmingham, Ala., Fort Barrancas, Fla.  
CROFT, Theodore C., 1st Lieut., Jacksonville, Fla., Camp Livingston, La.  
DANIEL, Rollin A., Jr., Captain, Nashville, Tenn., Camp Forrest, Tenn.  
DODSON, George D., Jr., 1st Lieut., Chattanooga, Tenn., Camp Croft, S. C.  
DOWELL, James W., 1st Lieut., Pincville, La., Camp Croft, S. C.  
DOZIER, Horace B., 1st Lieut., New Orleans, Camp Croft, S. C.  
DURIAM, Bon M., 1st Lieut., Augusta, Ga., Camp Croft, S. C.  
DYER, John Lewis, 1st Lieut., New Orleans, Camp Blanding, Fla.  
ELLIOTT, Cecil B., 1st Lieut., Gainesville, Ga., Fort Bragg, N. C.  
ELLIS, Frank F., Jr., 1st Lieut., Birmingham, Ala., Fort Bragg, N. C.  
FARRAGUT, Loyall David, Captain, Jonesboro, Tenn., Camp Forrest, Tenn.  
FARRAR, Taylor, 1st Lieut., Shelbyville, Tenn., Camp Forrest, Tenn.  
FISHER, William G., 1st Lieut., New Orleans, Fort Bragg, N. C.  
FITZGERALD, William J., 1st Lieut., New Orleans, Camp Davis, N. C.  
FUNK, Barclay, 1st Lieut., Alexandria, La., Camp Polk, La.  
GRAY, Cyrus L., Jr., 1st Lieut., Durham, N. C., Camp Claiborne, La.  
GREEN, Arthur W., 1st Lieut., Memphis, Tenn., Fort Bragg, N. C.  
GREEN, Daniel M., 1st Lieut., Memphis, Tenn., Camp Blanding, Fla.  
GREEN, James A., 1st Lieut., Atlanta, Ga., MacDill Field, Fla.  
GREENBERG, S. A., 1st Lieut., Florence, S. C., Camp Polk, La.  
GRIMES, William H., Jr., 1st Lieut., Colquitt, Ga., Fort Bragg, N. C.  
HARRIS, Reuben Rhys, 1st Lieut., Birmingham, Ala., Camp Blanding, Fla.  
HARVARD, Bell M., Jr., 1st Lieut., New Orleans, Fort Benning, Ga.  
HASPEL, Robert R., 1st Lieut., New Orleans, Fort Benning, Ga.  
HENDERSON, Hilary H., Jr., 1st Lieut., Birmingham, Ala., Camp Livingston, La.  
HENRY, Blonds S., 1st Lieut., Memphis, Tenn., Camp Davis, N. C.  
HERBERT, William C., Jr., 1st Lieut., Spartanburg, S. C., Camp Forrest, Tenn.  
HICKS, David Y., Jr., 1st Lieut., Augusta, Ga., Camp Wheeler, Ga.  
HILL, Thurman K., 1st Lieut., Nashville, Tenn., Camp Livingston, La.  
HILLARD, Irving R., 1st Lieut., Jackson, Tenn., Fort Bragg, N. C.  
HOLLIMAN, Henry D., Jr., 1st Lieut., Atlanta, Ga., Fort Jackson, S. C.  
HOLLOMAN, Walter G., 1st Lieut., Monroe, La., Camp Wheeler, Ga.  
HOLMES, Verner S., 1st Lieut., McComb, Miss., Camp Forrest, Tenn.  
HOLT, Benton B., Jr., 1st Lieut., Charleston, S. C., Fort Jackson, S. C.  
HORN, Phillip Webster, 1st Lieut., New Orleans, Camp Blanding, Fla.  
HUBBARD, George B., 1st Lieut., Nashville, Tenn., Camp Forrest, Tenn.  
HUTTON, Vernon, Jr., 1st Lieut., Nashville, Tenn., Fort Jackson, S. C.  
JACKSON, Truxton L., 1st Lieut., Nashville, Tenn., Fort Bragg, N. C.  
JEANES, James Gregg, 1st Lieut., Clinton, S. C., Camp Davis, N. C.  
JERNIGAN, Sterling H., 1st Lieut., Atlanta, Ga., Fort Benning, Ga.  
KALMON, Edmond H., Jr., 1st Lieut., Nashville, Tenn., Camp Davis, N. C.  
KELLY, Alex R., Jr., 1st Lieut., Augusta, Ga., Camp Davis, N. C.  
KUNTZ, William M., 1st Lieut., New Orleans, Camp Claiborne, La.  
LAMBETH, Samuel S., III, 1st Lieut., Durham, N. C., Fort Bragg, N. C.  
LANE, Thomas H., 1st Lieut., Fairfield, Ala., Camp Livingston, La.  
LEVIN, Harold B., 1st Lieut., Atlanta, Ga., Camp Blanding, Fla.  
LEWIS, Lawrence C., Jr., 1st Lieut., Tuskegee, Ala., Camp Blanding, Fla.  
LOVE, William G., Jr., 1st Lieut., Atlanta, Ga., Fort Benning, Ga.  
LOWENSTEIN, Sol L., 1st Lieut., Nashville, Tenn., Camp Livingston, La.  
LYLE, Philip Lewis, 1st Lieut., Clarksville, Tenn., Camp Polk, La.  
MACPHERSON, Ford J. A., 1st Lieut., Ibrlin, La., Camp Shelby, Miss.  
MCCOOK, Walter W., Jr., 1st Lieut., Shreveport, La., Fort Bragg, N. C.  
MAGNE, Jacques A., 1st Lieut., New Orleans, Camp Polk, La.  
MARTIN, George H., 1st Lieut., Anguilla, Miss., MacDill Field, Fla.  
MASON, James M., III, 1st Lieut., Birmingham, Ala., Fort Bragg, N. C.  
MASTERS, ELIAS W., 1st Lieut., Anderson, S. C., Fort Jackson, S. C.  
MICKAL, Abe, 1st Lieut., New Orleans, Fort Bragg, N. C.  
MILLER, John M., 1st Lieut., Augusta, Ga., Fort Bragg, N. C.  
MITCHELL, Charles B., Major, Mississippi A. & M. College, Camp Shelby, Miss.  
MITCHELL, George J., 1st Lieut., Meridian, Miss., Camp Blanding, Fla.  
MONTAGNET, J. M., Jr., 1st Lieut., New Orleans, Camp Forrest, Tenn.  
MORROW, Arch S., 1st Lieut., Jacksonville, Fla., Fort Bragg, N. C.  
MOTTY, Jules Stell, 1st Lieut., New Orleans, Camp Davis, N. C.  
MURPHY, Robert J., Jr., 1st Lieut., Durham, N. C., Fort Bragg, N. C.  
NETTERVILLE, Rush E., 1st Lieut., New Orleans, Camp Croft, S. C.  
NICHOLS, Ralph Gibbs, 1st Lieut., Knoxville, Tenn., Camp Polk, La.  
NILES, George A., Jr., 1st Lieut., Atlanta, Ga., Camp Davis, N. C.  
PARKS, Lorenzo Lynn, Major, Jacksonville, Fla., Headquarters 4th Army Corps, Jacksonville, Fla.  
PARNELL, Homer S., Jr., 1st Lieut., New Orleans, Camp Polk, La.  
PARROTT, John H., 1st Lieut., Camp Shelby, Miss., Fort Benning, Ga.  
PASTERNAK, Morris, 1st Lieut., New Orleans, Fort Jackson, S. C.  
PATTERSON, McLeod, 1st Lieut., New Orleans, Camp Croft, S. C.  
PEPE, John Luke, 1st Lieut., New Orleans, Fort Jackson, S. C.  
PETERSON, Bedford F., 1st Lieut., Bolivar, Tenn., Camp Wheeler, Ga.  
PHILLIPS, Benjamin J., 1st Lieut., New Orleans, Fort Jackson, S. C.  
PHILLIPS, James B., Jr., 1st Lieut., Chattanooga, Tenn., Camp Croft, S. C.  
PINSON, Harry D., 1st Lieut., Augusta, Ga., Camp Croft, S. C.  
PIZZOLATO, Philip, 1st Lieut., New Orleans, Camp Croft, S. C.  
POLITES, Nicholas, 1st Lieut., Wilmington, N. C., Camp Polk, La.  
POLLARD, Edward V., 1st Lieut., Parsons, Tenn., Fort Bragg, N. C.  
POPE, Madison R., 1st Lieut., Charleston, S. C., Fort Bragg, N. C.  
RAGGIO, Francis W., Jr., 1st Lieut., New Orleans, Camp Wheeler, Ga.  
RAGSDALE, William E., Jr., 1st Lieut., Memphis, Tenn., MacDill Field, Fla.  
RANCK, Edward Buford, 1st Lieut., Atlanta, Ga., Camp Forrest, Tenn.  
RAYENEL, Joseph A., 1st Lieut., New Orleans, MacDill Field, Fla.  
RAY, Russell B., 1st Lieut., Memphis, Tenn., MacDill Field, Fla.  
RHAME, Delmar O., Jr., 1st Lieut., Clinton, S. C., Camp Livingston, La.  
ROBINSON, Edward B., Jr., 1st Lieut., Birmingham, Ala., Camp Blanding, Fla.  
SCHONLAU, James W., 1st Lieut., Shreveport, La., Camp Forrest, Tenn.  
SILBERMAN, Donald J., 1st Lieut., Birmingham, Ala., Camp Claiborne, La.  
SIMMONS, William G., 1st Lieut., Emory, Ga., MacDill Field, Fla.  
SMERZNAK, John J., 1st Lieut., Concord, N. C., Camp Livingston, La.  
SMITH, Harold M., 1st Lieut., Savannah, Ga., Camp Wheeler, Ga.  
SPITZBERG, R. H., 1st Lieut., Mobile, Ala., Camp Forrest, Tenn.  
STANDER, Alvin A., 1st Lieut., Baton Rouge, La., Camp Davis, N. C.  
STELLING, Frank H., III, 1st Lieut., Augusta, Ga., Camp Croft, S. C.  
STERN, Henry M., 1st Lieut., New Orleans, Camp Davis, N. C.  
STEWART, James B., 1st Lieut., Milledgeville, Ga., Fort Benning, Ga.  
STILLMAN, Sidney, 1st Lieut., New Orleans, Fort Bragg, N. C.  
SUARES, John C., 1st Lieut., New Orleans, Camp Croft, S. C.  
TALBOT, Joe Dudley, 1st Lieut., New Orleans, Fort Bragg, N. C.  
TATUM, Roy Carroll, Lieut. Col., Salisbury, N. C., Med. Rep. 1st M. A., Knoxville, Tenn.  
THOMAS, Henry W., 1st Lieut., Atlanta, Ga., Fort Bragg, N. C.  
THOMAS, Herbert H., 1st Lieut., University, Ala., Fort Bragg, N. C.



# MEDICAL PREPAREDNESS

Jour. A. M. A.  
May 31, 1941

THOMAS, Paul J., 1st Lieut., New Orleans, MacDill Field, Fla.  
THOMPSON, Samuel B., 1st Lieut., Fairfield, Ala., Camp Polk, La.  
TIMMERMAN, William B., 1st Lieut., Hartsville, S. C., Camp Wheeler, Ga.  
VARINO, George A., 1st Lieut., Monroe, La., Camp Davis, N. C.  
VARNER, John B., 1st Lieut., Memphis, Tenn., Fort Bragg, N. C.  
VINSANT, Lowell E., 1st Lieut., Knoxville, Tenn., Fort Bragg, N. C.  
VORDER BRUEGGE, Colin F., 1st Lieut., Memphis, Tenn., Camp Wheeler, Ga.  
VUNK, Raymond H., 1st Lieut., Charleston, S. C., Fort Bragg, N. C.  
WARD, Leamon M., 1st Lieut., New Orleans, Fort Bragg, N. C.  
WEBB, George M., 1st Lieut., Tallulah, La., Camp Livingston, La.  
WHITLEY, James R., 1st Lieut., Chattanooga, Tenn., MacDill Field, Fla.

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

## SIXTH CORPS AREA

ACOCKS, James R., 1st Lieut., Houghton, Mich., Selfridge Field, Mich.  
ALBI, Raphael W., 1st Lieut., Lake City, Mich., Station Complement, Camp Wheeler, Ga.  
ALBIN, Meyer S., 1st Lieut., Cadillac, Mich., Station Complement, Croft, S. C.  
ALLEGRETTI, Joseph E., Captain, Chicago, Station Complement, Camp Axel, Ben John, 1st Lieut., Madison, Wis., Station Complement, Camp Jackson, S. C.  
BACHHUBER, Edward A., 1st Lieut., Mayville, Wis., Station Hospital, Fort Sill, Okla.  
BENISON, Arthur L., 1st Lieut., Edmore, Mich., Station Complement, Camp Wheeler, Macon, Ga.  
BERKELHAMER, Ralph C., 1st Lieut., Chicago, Station Complement, Camp Davis, N. C.  
BUSCAGLIA, Chris J., 1st Lieut., Ypsilanti, Mich., 11th Station Hospital, Fort Custer, Mich.  
BRAND, Ashley M., 1st Lieut., Chicago, 210th Corps Area (Anti-aircraft), U. S. National Guard, Fort Sheridan, Ill.  
BROOKS, Lewis C., Captain, Freeport, Ill., 27th Division, Fort McClellan, Ala.  
BROWNELL, Paul G., 1st Lieut., Detroit, Station Complement, Fort Jackson, S. C.  
CHRISTENSON, Albert W., Lieut. Col., Rockford, Ill., Savanna Ordnance Depot, Proving Ground, Ill.  
CITRON, Robert R., 1st Lieut., Peoria, Ill., 24th Infantry, Fort Benning, Ga.  
CLAUDON, Dann B., 1st Lieut., Jefferson, Wis., Station Hospital, Camp Grant, Ill.  
CLAXTON, Wilbert T., 1st Lieut., Britton, Mich., Station Hospital, Fort Sill, Okla.  
DIETRICH, Hervey W., 1st Lieut., Madison, Wis., Medical Detachment, 7th Cavalry, Fort Bliss, Texas.  
DUDLEY, Erwin F., Major, Decatur, Ill., 11th Station Hospital, Fort Custer, Mich.  
DUNN, Marion F., 1st Lieut., Waukegan, Ill., Infirmary, Medical Replacement Center, Camp Grant, Ill.  
EGGERS, John F., 1st Lieut., Sycamore, Ill., 27th Division, Medical McClellan, Ala.  
ESPEY, Hugh S., 1st Lieut., Zenia, Ohio, Station Complement, Fort Croft, S. C.  
FALICK, Mordecai L., 1st Lieut., Detroit, Station Complement, Camp Jackson, S. C.  
FEIGELMAN, Meyer J., 1st Lieut., Detroit, Station Complement, Camp Wheeler, Macon, Ga.  
GLOSS, Kenneth E., 1st Lieut., Crystal Falls, Mich., Air Corps Basic Flying School, San Angelo, Texas.  
HALE, Claude E., 1st Lieut., Marshall, Mich., Station Hospital, Fort Sam Houston, Texas.  
HANNAN, Kenneth D. L., 1st Lieut., Prairie Du Sac, Wis., 27th Division, Fort McClellan, Ala.  
HANSEN, Harvey C., 1st Lieut., Battle Creek, Mich., 24th Infantry, Fort Benning, Ga.  
HARPER, Jesse T., Captain, Detroit, Station Hospital, Fort Custer, Mich.  
HORA, James L., 1st Lieut., Chicago, 27th Division, Fort McClellan, Ala.  
HOROWITZ, Samuel F., 1st Lieut., Bay City, Mich., Station Complement, Camp Croft, S. C.  
HUTCHISON, William A., 1st Lieut., Chicago, Station Complement, Selfridge Field, Mich.  
IVKOVICH, Paul, 1st Lieut., Evart, Mich., Station Complement, Camp Croft, S. C.  
KANTER, Myron F., 1st Lieut., Chicago, Station Complement, Camp Davis, N. C.  
KNAPP, Joseph L., 1st Lieut., Traverse City, Mich., Station Complement, Camp Croft, S. C.

WHITWORTH, Clyde W., 1st Lieut., Clarksville, Ga., Camp Livingston, La.  
WILKES, William A., 1st Lieut., Augusta, Ga., Fort Bragg, N. C.  
WILLIAMS, Claiborne, 1st Lieut., Nashville, Tenn., Elementary Flying School, Tuscaloosa, Ala.  
WILSON, Issac R., Jr., 1st Lieut., Charleston, S. C., Fort Bragg, N. C.  
WILSON, James A., 1st Lieut., New Orleans, MacDill Field, Fla.  
WILSON, John McQ., 1st Lieut., Memphis, Tenn., Camp Shelby, Miss.  
WILSON, Shelburne D., 1st Lieut., Mountain City, Tenn., Fort Benning, Ga.  
WYATT, Charles N., Captain, Greenville, S. C., Camp Forrest, Tenn.  
YANCEY, Cyril T., 1st Lieut., New Orleans, Fort Bragg, N. C.  
YOUNG, John D., 1st Lieut., Atlanta, Ga., MacDill Field, Fla.

LIVINGSTON, A. Edward, 1st Lieut., Denver, Station Hospital, Fort Sill, Okla.  
LOGSDON, Robert E., 1st Lieut., Mount Sterling, Ill., Station Hospital, Fort Sill, Okla.  
LONGWELL, Charles W., 1st Lieut., Nashville, Ill., Station Hospital, Fort Bliss, Texas.  
LOOMIS, Frederic G., 1st Lieut., Waterloo, Iowa, Station Complement, Camp Shelby, Miss.  
MILLER, Harold A., 1st Lieut., Saline, Mich., 23d Evacuation Hospital, Fort Custer, Mich.  
MAERCKLEIN, Arthur G., Captain, Union Grove, Wis., Station Complement, Camp Davis, N. C.  
MOORE, Gregory P., Captain, Cadillac, Mich., 94th Engineer Battalion, Fort Custer, Mich.  
MUMLER, William C., 1st Lieut., Chicago, Station Hospital, Fort Sheridan, Ill.  
MUSSELMAN, Merle M., 1st Lieut., Ann Arbor, Mich., Station Hospital, Fort Bliss, Texas.  
NESBITT, William E., 1st Lieut., Alpena, Mich., Station Complement, Camp Wheeler, Ga.  
OLTMAN, Diedrich L., 1st Lieut., East Moline, Ill., Station Hospital, Fort Sam Houston, Texas.  
OSBORNE, Charles E., 1st Lieut., Vicksburg, Mich., Station Complement, Camp Wheeler, Ga.  
PALEMAO, Amiel L., 1st Lieut., Chicago, Station Hospital, Fort Bliss, Texas.  
PERNWORTH, Paul H., 1st Lieut., Venice, Ill., Scott Field, Ill.  
PHILLIPS, Francis J., 1st Lieut., Detroit, Station Complement, Camp Croft, S. C.  
POINDEXTER, Marlin H., Jr., 1st Lieut., Milwaukee, Station Complement, Camp Croft, S. C.  
PRZYGOCKI, Stanley F., Captain, Chicago, Station Complement, Camp Davis, N. C.  
RICHARDS, Francis L., 1st Lieut., Kearney, Neb., Station Complement, Camp Davis, N. C.  
RICKETTS, Frederick J., 1st Lieut., Sadorus, Ill., Selfridge Field, Mich.  
RODHOLM, Ansgar K., 1st Lieut., Chicago, Station Complement, Camp Croft, S. C.  
ROSE, Frederick E., Captain, Millstadt, Ill., Station Complement, Camp Wheeler, Ga.  
ROYER, Clark W., 1st Lieut., Battle Creek, Mich., Station Hospital, Fort Sam Houston, Texas.  
RUDENS, Maurice C., 1st Lieut., Chicago, Station Hospital, Fort Sill, Okla.  
SEIDMAN, Leon H., 1st Lieut., Chicago, Station Complement, Camp Croft, S. C.  
SHABART, Elmer J., 1st Lieut., Fort Sheridan, Ill., Station Complement, Camp Wheeler, Ga.  
SHAPIRO, Maynard I., 1st Lieut., Chicago, Station Complement, Fort Jackson, S. C.  
SHULMAN, Herbert, 1st Lieut., Madison, Wis., Station Complement, Camp Croft, S. C.  
SIBRANS, William A., 1st Lieut., East Detroit, Mich., Station Complement, Fort Jackson, S. C.  
SIEGEL, Irving, 1st Lieut., Chicago, Randolph Field, Texas.  
SIMENSON, Raymond S., 1st Lieut., Valdres, Wis., Medical Replacement Center, Camp Grant, Ill.  
TARRE, Harold L., 1st Lieut., Chicago, 24th Infantry, Fort Benning, Ga.  
THORNBURG, William M., 1st Lieut., DuQuoin, Ill., Station Hospital, Selfridge Field, Mich.  
THORNTON, John C., Jr., 1st Lieut., Brownsville, Tenn., Station Hospital, Fort Sill, Okla.  
TIMRECK, Harold A., 1st Lieut., Beaverton, Mich., Station Hospital, Fort Sam Houston, Texas.  
WIENER, Israel, 1st Lieut., Detroit, 24th Infantry, Fort Benning, Ga.  
WILLIAMSON, Edwin M., 1st Lieut., Detroit, Station Complement, Camp Wheeler, Ga.  
WOOD, Cordelle A., Major, Waukesha, Wis., 5th Division, Fort Custer, Mich.  
WORDEN, Robert W., 1st Lieut., Chicago, 207th General Hospital, Camp Livingston, La.

## AVIATION MEDICINE

The Los Angeles County Medical Association devoted its May 29 meeting to a discussion of aviation medicine. Dr. Isaac H. Jones opened the discussion; other speakers participating in the discussion were Lieut. Col. Ernest F. Harrison, flight surgeon, U. S. Army Air Corps; Comdr. Joel J. White, flight surgeon, U. S. Navy; Lieut. Comdr. John H. Korb, flight surgeon, U. S. Navy, and Dr. Robert W. Langley.

## MEDICAL OFFICERS WHO DESIRE TO ATTEND MEETINGS

The War Department has announced that officers of the medical department who desire to attend meetings of any of the national societies pertaining to their profession will be permitted to attend these meetings on detached service status and without expense to the government, provided their services



# ORGANIZATION SECTION

## OFFICIAL NOTES

### RADIO PROGRAM. AT CLEVELAND

The customary arrangements for radio broadcasts in connection with the annual session of the American Medical Association, at Cleveland, have been made.

The weekly dramatized program *Doctors at Work*, on the Blue network of the National Broadcasting Company, will close with the broadcast scheduled for Wednesday, June 4 at 10:30 p. m., Eastern daylight saving time, with a program entitled "March of Medicine, 1941." The dramatic episodes and music will originate at Chicago, as usual, but the summary will be delivered from the studios of WHK at Cleveland.

In addition, the following broadcasts have been scheduled on National Broadcasting Company and Columbia Broadcasting System networks, and Cleveland local stations:

WTAM-NBC. Monday, June 2. 7:45 p. m., eastern daylight saving time. Dr. N. B. Van Etten, New York. Medical progress and national defense.

WTAM. Wednesday, June 4. 10:10:15 p. m., eastern standard time. Dr. Lowell S. Selling, Detroit. Psychology of traffic offenses.

WTAM. Tuesday, June 3. 10:15:10:30 p. m., eastern standard time. Dr. John D. Currence, New York. Arthritis.

WTAM-NBC (Blue). Friday, June 6. 10:10:15 p. m., eastern daylight saving time. Dr. W. W. Bauer, Chicago. Convention news.

WHK. Tuesday, June 3. 11:15-11:30 a. m., eastern standard time. Dr. M. S. White, Randolph Field, Texas. Medical aspects of flying.

WHK. Thursday, June 5. 11:15-11:30 a. m., eastern standard time. Dr. J. West Mitchell, Sewickley, Pa. Diabetes.

WGAR-CBS. Wednesday, June 4. 9:15-9:30 p. m., eastern standard time. Dr. Frank H. Lahey, Boston. Progress in medicine and surgery.

WGAR-CBS. Thursday, June 5. Dr. W. W. Bauer. Science Service program. See local papers for time.

WGAR. Tuesday, June 3. 4:15-4:30 p. m., eastern standard time. Dr. Grover C. Penberthy, Detroit. The treatment of burns.

WGAR. Thursday, June 5. 4:15-4:30 p. m., eastern standard time. Dr. Gordon B. New, Rochester, Minn. The treatment of face injuries.

WCLE. Wednesday, June 4. 1:15-1:30 p. m., eastern standard time. Dr. Walter C. Alvarez, Rochester, Minn. Food allergies.

WCLE. Tuesday, June 3. 1:15-1:30 p. m., eastern standard time. Dr. G. Wilse Robinson Jr., Kansas City, Mo. Old age.

WTAM. Tuesday, June 3. 4:45-5 p. m. Woman's Club of the Air. Miss Jane Weaver, Cleveland, and Dr. W. W. Bauer, Chicago.

WTAM. Sunday, June 1. 2:2-15 p. m., eastern standard time. Dr. Morris Fishbein, Chicago. Preview of the convention.

Special broadcasts for the children in Cleveland and suburban schools have been scheduled on the short wave radio station WBOE, operated by the Cleveland Board of Education, as follows:

1. Wednesday, June 4. 2:10-2:25 p. m., eastern standard time. Dr. M. E. Obermayer, Chicago. Skin and adolescence.

2. Thursday, 10:30-10:45 a. m. Dr. Sara M. Jordan, Boston. Constipation and laxatives.

## MEDICAL ECONOMIC ABSTRACTS

### MEDICAL CARE FOR THE AGED IN WASHINGTON

#### A REPORT BY THE BUREAU OF MEDICAL ECONOMICS

At the election held in the state of Washington, Nov. 5, 1940 Initiative No. 141 providing for an old age pension of not less than \$40 a month including any other income of the recipients was adopted by a vote of 358,009 with 258,819 against it. It is expected that the federal government will contribute one half, or \$20, and the measure provides that in case the federal contribution is increased the state shall add a sum equal to whatever the federal subsidy may be. A section of the law which seems to have attracted little attention when the initiative was under discussion says:

In addition to Senior Citizen Grants, the Department shall provide for those eligible medical, dental, surgical, optical, hospital and nursing care by a doctor of recipient's own choosing; and shall also provide artificial limbs, eyes, hearing aids and other needed appliances.

Although at the time the law was enacted there were only 45,000 persons receiving an old age pension, the Social Security Department has since accepted 15,000 more, making a total of 60,000 old age recipients. It is now thought that the total number of recipients may reach 70,000 or possibly 75,000. The state must bear the entire expense of the medical care furnished. When the budget was first made up in December 1940 an item of \$4,320,000 was included. The Washington State Medical Association after studying the provisions of the act concluded that a minimum of \$9,700,000 would be required to provide medical care to 45,000 recipients. The governor finally recommended an appropriation of \$5,320,000, which in his opinion would be sufficient. Of this amount 50 per cent, or \$2,660,000, was definitely earmarked for doctors' services. The attorney general ruled that the word "doctor" would include doctors of medicine, dentists, osteopaths, chiropractors and chiropodists.

Information taken from Initiative Measure 141, the mimeographed regulations for the conduct of the act, *Northwest Medicine* 40:151 (April) 1941, and a letter from Dr. V. W. Spickard, secretary-treasurer of the Washington State Medical Association.

The act is to be administered by the State Medical-Dental Board of the State Department of Social Security. Nine members of this board have already been appointed, and an additional one is to be appointed by the State Hospital Association. Of those appointed, two physicians were approved by the Washington State Medical Association, two physicians appointed by the State Department of Social Security, two dentists approved by the State Dental Association, one physician by the State Department of Health, one registered nurse to represent the State Nurses Association and one layman who is assistant to the director of the State Department of Social Security. An interesting feature of the administrative machinery is that the agencies chosen for providing the medical service are the medical service bureaus operated by the county medical societies. There are fourteen of these listed in the regulations. A majority of these provide service in two or more counties, so that almost the entire state of Washington is within the field covered by some medical-dental service bureaus. The plan operates under a fee schedule submitted by the Washington State Medical Association as follows:

First office or home visit.....	\$3.00
Subsequent home visits.....	2.50
Subsequent office visits.....	2.00
Night calls from 9 p. m. to 7 a. m.....	4.50
Consultation .....	3.00
Roentgenograms and laboratory work, except in emergencies, shall be authorized by the Medical Service Bureau and shall be at the State Department of Labor and Industries' rates and subject to the same proration as other fees.	
Eye examinations with refraction.....	5.00

However, this fee schedule is to be paid on the unit system by which the available funds are to be prorated monthly. The medical service bureaus are permitted to make a service charge not to exceed 7 per cent of the bills submitted. There is to be free choice of physicians, osteopaths or chiropractors among all those who agree to abide by the regulations. Hospital care, however, will be provided in county hospitals, and medical care within the hospital will be given by the hospital staff and not by the patient's chosen physician. Prescriptions are not

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paid for. Medical and optical care will be given. In acute illnesses recipients are limited to seven visits, after which additional authorization must be obtained. In chronic cases care is limited to one visit a week for a period not to exceed three months. Appliances, including glasses, will be provided through the county welfare department within the limits of available funds.

### THE BRITISH REGIONAL HOSPITAL SCHEME

In January the Nuffield Provincial Hospital Trust published a proposed scheme for a regional reorganization of British hospitals, which has given rise not only to a great deal of discussion but to some important steps toward its realization.<sup>1</sup> The policy of the trust is briefly described as follows:

(a) To divide the country into a number of regions with the object of establishing in each an organization of hospital and health services through a regional council representing the voluntary hospitals and local authorities within the region. It is intended that a hospital or group of hospitals associated with a university medical school should be the regional center whenever possible and the region should be subdivided into two, three or more divisions based on a "key" hospital, each with a divisional hospitals council appointing representatives on the regional council.

(b) To give financial aid to the initiation and support of these regional councils.

(c) To allot, on application, to such regional or divisional councils sums of money for the promotion of hospital and health services, medical research and teaching which, in the opinion of the regional council, are necessary to meet the needs of the population in the region.

Regional hospital councils have already been constituted in three different parts of the country. The regional councils in these districts have undertaken the following activities:

(a) Survey of hospital services on a regional or divisional basis with the object of preparing a comprehensive report on the existence of duplication or overlapping or the necessity for the development of new services or the extension of services already available.

(b) Organization of a system of transfer of patients from the "key" hospital to other hospitals within the division after operation or for the

1. Buzzard, Sir E. Farquhar, Chairman of the Medical Advisory Council of the Trust: Post-War Hospital Policy, The Nuffield Provincial Hospital Trust at Work, *Lancet* 1: 155 (Feb. 1) 1941.

continuation of treatment. The result of this arrangement is to reduce the period of occupation of beds in the "key" hospital, thus freeing these beds for other patients requiring such specialist treatment as is obtainable in other hospitals in the division. It is hoped that this system will reduce waiting lists and thus be of great benefit to the community.

(c) Organization of a divisional blood transfusion services.

(d) Organization of a divisional system of ear, nose and throat clinics. This arrangement is intended to provide a system of clinics in a number of district hospitals in affiliation to the ear, nose and throat department of the "key" hospital in the division.

(e) Proposals are under consideration for (1) regional or divisional accident services, (2) regional pathologic services and, in connection with the latter proposals, it is considered that a pathologic service is not only urgently necessary but is peculiarly well adapted to regional organization.

The plan assumes the formation of a primary or key hospital or group of hospitals which should, if possible, be connected with a medical school. The smaller hospitals, generally with less than twenty beds, within each region are to be linked up with the key hospitals with the understanding that the smaller hospital should undertake the care of patients from their neighborhood "who do not need more special skill than can be obtained locally or by visits of specialists from the center and who are ready to leave the key hospital and are not yet fit to return to their homes." It proposed that the key hospitals shall be linked with the smaller institutions by a system of periodic visits by the consulting staff of the key hospitals and the organization of special services, such as pathologic, accident and cancer, on a regional basis.

The growth of municipal hospitals since the local government act of 1929 has proceeded to the point at which they now have more beds than the voluntary hospitals. It is proposed to include both municipal and voluntary hospitals in the plan and to establish regional medical advisory committees representative of the various branches of the medical profession. These advisory committees will have the responsibility of advising the regional councils with regard to the development, the limitation or the curtailment of services in order to avoid wasteful overlapping or competition.

## MEDICAL LEGISLATION

### STATE MEDICAL LEGISLATION

#### Connecticut

*Bill Introduced.*—Substitute for H. 1813 proposes to permit a registered physician to advise and prescribe for married persons regarding marriage problems and to give such persons access to medical information and supplies conducive to health, notwithstanding the restrictions contained in the laws of Connecticut relating to the use of drugs or instruments for the prevention of conception.

#### Florida

*Bill Introduced.*—H. 1230, to amend the medical practice act, proposes to eliminate those provisions which require that, of the ten members of the board of medical examiners, five shall be allopathic physicians, three, eclectic physicians and two, homeopathic physicians.

#### Illinois

*Bill Introduced.*—H. 809 proposes to enact a new chiropractic practice act. The bill proposes that "A person practices chiropractic within the meaning of this Act who offers or undertakes, by any means or method, to diagnose, recommend, or prescribe for any ailment or supposed ailment of the human foot or another or who offers or undertakes the local, medical, mechanical or surgical treatment of any ailment or supposed ailment of the human foot of another including general manipulative massage, whether manual, mechanical or electrical, except amputation of the foot or toes or the use of anesthetics other than local, or the use of drugs or medicines other than local anesthetics."

### DISTRICT OF COLUMBIA

*Bill Introduced.*—H. R. 4786, introduced by Representative Randolph, West Virginia, proposes to require examination and laboratory tests for syphilis, gonorrhea and tuberculosis of all applicants for marriage licenses in the District of Columbia.

### MEDICAL BILLS IN CONGRESS

*Changes in Status.*—H. R. 4258 has passed the House, providing that whoever brings on board or has in his possession or control on board any vessel of the United States any narcotic drug not constituting a part of the cargo entered in the manifest or part of the ship stores shall be subject to fine or imprisonment, or both. H. R. 4293 has passed the House, providing that any person who furnishes blood for transfusion into the veins of any person entitled to undergo treatment at government expense or who shall furnish blood for blood banks or for other scientific and research purposes shall be entitled to be paid therefor a sum not to exceed \$50 for each blood withdrawal. The Senate Committee on Public Buildings and Grounds has concluded hearings on H. R. 4545, a bill to provide for the acquisition and equipment of public works made necessary by the defense program, including the acquisition and equipment of hospitals. S. 194 has been passed by the Senate, proposing to authorize research by the United States Public Health Service relating to the cause, diagnosis and treatment of dental diseases.

*Bills Introduced.*—S. 1527, introduced by Senator Smathers, and H. R. 4789, introduced by Representative Wene, both of New Jersey, propose a federal appropriation of \$4,000,000 to construct a veterans' hospital in New Jersey with a capacity of not less than one thousand beds. H. R. 4770, introduced by request, by Representative May, Kentucky, proposes to amend the Selective Training and Service Act so as to authorize the President to provide for the deferment, by age group, from training and service under the act of those men whose ages are such that he finds that deferment to be advisable in the national interest. H. R. 4793, introduced by Representative O'Brien, Michigan, proposes an annual appropriation of \$50,000,000 to provide rehabilitation and employment for needy physically handicapped persons.

# Medical News

# MEDICAL NEWS

2517

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)  
ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 2543.

## ILLINOIS

**Survey of Crippled Children.**—Information has been collected on more than 32,000 crippled children in the state through a survey now nearing completion by the WPA and the state division for handicapped children. Details cover the crippling condition, race, sex, age and county of residence, providing data on an exceptionally large group of cases for research studies and establishing the basis for a more nearly complete current registry of crippled children throughout the state. The maintenance of a current registry is required by the U. S. Children's Bureau of the state division charged with giving services to crippled children under the provisions of the social security act.

## Chicago

**Hospital News.**—Construction has been started on a new \$300,000 addition to the Mount Sinai Hospital to house the new pediatric department, semiprivate facilities for white collar workers and deluxe private room accommodations. A new morgue and necropsy room and a new ambulance entrance with adjoining emergency room will also be built.

**Meeting of Academy of Sciences.**—Dr. Nathan Smith Davis III was reelected president of the Chicago Academy of Sciences at its eighty-fourth annual meeting, April 14. The speaker of the evening, Dr. Andrew C. Ivy, whose address was entitled "The Gastrointestinal Hormones and Their Uses," was elected an honorary member of the academy.

**University News.**—Reuben L. Kahn, Sc.D., assistant professor of bacteriology and serology in charge of clinical laboratories, University of Michigan Medical School, Ann Arbor, lectured at Mercy Hospital, April 25, under the auspices of the department of preventive medicine, public health and bacteriology, Loyola University School of Medicine. His subject was "Newer Observations in the Serology of Syphilis."

**Personal.**—Dr. James H. Hutton has been appointed state health consultant of the National Youth Administration for Illinois; he will direct the procedure for physical examinations of NYA youth in the state.—Dr. Earl E. Kleinschmidt, associate professor and chairman of the department of public health, preventive medicine and bacteriology at Loyola University School of Medicine, has been granted leave of absence for three months to work in Washington making plans for the protection and guidance of students employed in vocational training for defense work in industry.

**The Capps Prize.**—The Institute of Medicine of Chicago offers a prize of \$400 for the most meritorious investigation in medicine or in the specialties of medicine. The investigation may be also in the fundamental sciences, provided the work has a definite bearing on some medical problem. The competition is open to graduates of Chicago medical schools who completed their internship or one year of laboratory work in 1939 or thereafter. Manuscripts must be submitted to the secretary of the institute, 86 East Randolph Street, not later than December 31. If no paper is deemed worthy of the prize, the award may be withheld at the discretion of the board of governors.

## IOWA

**Personal.**—Dr. Wallace S. Petty, Sioux City, has resigned as health officer of Woodbury County. He has been succeeded by Dr. John A. Cowan, who has been acting director of public health for Sioux City and Woodbury County.—Dr. James E. Dyson has been appointed acting director of health of the public schools of Des Moines. He fills the vacancy that occurred when Dr. Fred Moore died recently. Dr. Dyson graduated at the University of Minnesota Medical School, Minneapolis, in 1916.—Dr. David T. Nicoll, Mitchellville, was recently made a life member of the Polk County Medical Society on his completion of fifty years in the practice of medicine.

**Society News.**—The Calhoun County Medical Society was addressed in Rockwell City, April 15, by the following physicians from Council Bluffs: Drs. McMicken Hanchett, "Treatment of Tetanus"; Aldis A. Johnson, "Newer Procedures in Diagnostic Medicine," and Jack V. Treynor, "Treatment of Subacute Throat Infections."—Dr. Henry G. Decker, Des Moines, discussed "Relief of Intractable Pain" before the Humboldt County Medical Society in Humboldt, April 17.—Dr. Rolland Russell Best, Omaha, addressed the Johnson County Medical Society, April 2, in Iowa City on "Applica-

## CALIFORNIA

**Society News.**—The Junior Section of the Los Angeles County Medical Association and the Junior Bar Association of Los Angeles held a joint symposium, May 15.—Dr. Joseph Brennemann, Los Angeles, discussed "Appendicitis in Childhood" before the Hollywood Academy of Medicine, May 8.  
**Flower Show Society.**—The *Bulletin* of the Los Angeles County Medical Association announces that a Physicians' Flower Show Society will be formed, evidencing the success of the society's first flower show, held April 16-17. A section will be created within the new society especially for the wives of members who are interested in flower arrangements. The bulletin also announced a two day exhibit to be held this fall during the chrysanthemum season.

## DELAWARE

**Appointments at du Pont Institute.**—Dr. Daniel Murray Angevine, assistant professor of pathology at Cornell University Medical College, New York, was appointed bacteriologist and pathologist at the Alfred I. du Pont Institute of the Nemours Foundation at Wilmington, effective May 1. According to *Science*, other appointments that have been made recently include Dr. Lee E. Farr, associate in medicine at the Hospital of the Rockefeller Institute for Medical Research, New York, as director of research and pediatrician-in-chief. He became at the same time visiting associate professor of pediatrics at the University of Pennsylvania School of Medicine, Philadelphia. Dr. Douglas A. MacFadyen, associate in chemistry at the Rockefeller Hospital, has been appointed chief of biochemistry at the du Pont Institute and visiting assistant professor of pediatrics at Pennsylvania.

## FLORIDA

**Personal.**—Dr. Leland H. Dame, Jasper, has been named health officer for Highlands and Glades counties, succeeding Dr. Erwin F. Hoffman, Sebring, resigned.—W. C. McLeod, D.D.S., Pensacola, has been appointed a member of the merit system council for the state board of health and the crippled children's commission; the council is to establish general policies for the administration of the merit system under which employees of the board and commission will work.  
**State Medical Election.**—Dr. Gilbert S. Osincup, Orlando, was named president-elect of the Florida Medical Association at its annual meeting recently and Dr. Walter C. Jones Jr., Miami, was installed as president. Other officers of the association include Drs. Luther W. Holloway, Jacksonville, Fredrick K. Herpel, West Palm Beach, Walter C. Payne, Pensacola, vice presidents; Dr. Shaler A. Richardson, Jacksonville, secretary-treasurer, and Stewart G. Thompson, D.P.H., Jacksonville, managing director. The 1942 session will be in West Palm Beach.

## IDAHO

**State Medical Meeting in Sun Valley.**—The forty-ninth annual session of the Idaho State Medical Association will be held at the Sun Valley Lodge, Sun Valley, June 18-21, under the presidency of Dr. Abram M. Newton, Pocatello. Guest speakers will include the following members of Stanford University School of Medicine, San Francisco:  
Dr. William Dock, Etiology and Pathology of Hypertension; Causes of Peptic Ulcer and Their Control; Cancer from the Pathologist's Angle.  
Dr. David A. Ryland, Management of Hypertension; Management of Bright's Disease; Nature and Treatment of Obesity.  
Dr. Maurice L. Tainter, Practical Application of Sympathomimetic Drugs Including Benzadrine; New Remedies Used in Gastrointestinal Disease, Including Colloid Laxatives; Medicinal Treatment of Asthma and Other Allergies; Present Status of Sulfonamide Derivatives.  
Dr. Carleton Mathewson Jr., Diagnosis and Treatment of Bowel Obstruction; Surgical Treatment of Peptic Ulcer; Ambulatory Treatment of Fractures of the Lower Extremity.  
Dr. Nelson J. Howard, The Endocrine Basis of Benign Lesions of the Breast; Pathology and Clinical Features of Disease of Tendons; Common Injuries to the Heart.  
In addition, instruction courses will be conducted by members of the state medical association. A round table luncheon is planned for each day. Golf and bowling tournaments are also on this year's program.

## MEDICAL NEWS

tion of the Biliary Flush in the Treatment of Biliary Tract Disease."—Dr. Irvine McQuarrie, Minneapolis, discussed "Experiments of Nature in Clinical Medicine" before the Linn County Medical Society, April 10, in Cedar Rapids.

### MAINE

**Society News.**—A symposium on lesions of the stomach and duodenum was presented before the Portland Medical Club, April 1, by Drs. Elton R. Blaisdell and Jack Spencer; papers were presented by Drs. George A. Tibbetts and Isaac M. Webber on "Acute Surgical Emergencies" and "Gastric Resection" respectively. —Dr. Donald Munro, Boston, discussed "Immediate Treatment of Head Injuries" before the Kennebec County Medical Association in Augusta, April 17. —The Knox County Medical Association was addressed in Rockland, April 8, by Dr. Katherine S. Andrews, Boston, on "Gastric Cancer." —The York County Medical Association devoted its meeting in Sanford, April 2, to a panel discussion on endocrine dysfunction. Participating were Drs. James Carswell Jr. and Howard L. Apollonio, Camden, and Paul A. Jones, Union.

### MASSACHUSETTS

**The Henry Jackson Lecture.**—Comdr. John R. Poppen, bureau of aeronautics, U. S. Navy Department, Washington, D. C., delivered the Henry Jackson Lecture for 1941, under the auspices of the New England Heart Association, May 2. His subject was "Cardiovascular Problems in Aviation Medicine."

**Fellowship Awarded.**—Dr. Israel Kapnick, Providence, R. I., now studying at the Massachusetts General Hospital, Boston, has been awarded the Louis E. Kirstein Fellowship at Harvard Medical School for the summer of 1941. The fellowship was established through a gift of \$28,550 made to Harvard University by eighty-nine friends of Mr. Kirstein, vice president of William Filene's Sons Company, in honor of his seventieth birthday and in recognition "of their affection for him as a man and their admiration of him as a humanitarian." In accordance with the request of the donors, the fund remains active so that additions may be made to it from time to time. Dr. Kapnick graduated at Harvard in 1938.

### MINNESOTA

**The Root Medical History Lecture.**—Dr. Arno B. Luckhardt, professor of physiology, Department of Medicine, University of Chicago, delivered the annual William W. Root Medical History Lecture at the University of Minnesota Medical School, Minneapolis, April 29. The lecture is sponsored by Alpha Omega Alpha Fraternity. His subject was "Dr. William Beaumont and the Medical Epic of Northwest Territory."

**University News.**—A course in roentgen diagnosis of non-tuberculous diseases of the lungs and pleura was offered at the Center for Continuation Study, University of Minnesota, Minneapolis, May 22-24. Enrollment was limited to physicians with special training in radiology. —The Carnegie Corporation has made a grant of \$5,000 to the University of Minnesota for the continued support of investigations of viruses in relation to cell growth, conducted under the direction of Dr. Robert G. Green, professor of bacteriology and immunology at the medical school.

**Society News.**—Carl G. Hartman, Ph.D., Baltimore, addressed the Hennepin County Medical Society, Minneapolis, April 7, on the "Use of Gonadotropic Substances in Gynecology (based largely on controlled experiments in the monkey) and Administration of Steroidal Hormones in the Form of Pellets (Estrogen Therapy) and Possible Carcinogenesis." —The Minnesota Pathological Society was addressed in Minneapolis, April 12, by Drs. Robert G. Green and Charles A. Evans on "Vitamin B Deficiency from Fish Diets" and Elexious T. Bell, "Pathologic Physiology of the Kidney." All are of Minneapolis. —Dr. Max W. Alberts, St. Paul, discussed "Complicating Factors Associated with Cancer of the Large Bowel" before the Minnesota Academy of Medicine in St. Paul, April 9.

### NEBRASKA

**Lecture by Dr. Dam.**—Professor Henrik Dam of the Biochemical Institute, Copenhagen, Denmark, addressed a special meeting of the Lancaster County Medical Society, Lincoln, April 10, on "Clinical Aspects of Vitamin K."

**Personal.**—Dr. George E. Charlton, superintendent of the Norfolk State Hospital, Norfolk, was recently honored by a reception marking his twenty-fifth year of association with the hospital. He was appointed superintendent in 1916 and has

served continuously since that time except for two years when he was superintendent at the Hastings State Hospital at Ingleside.

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### NEW YORK

**Society News.**—Dr. Sumner L. S. Koch, Chicago, was the guest speaker at a meeting of the Western New York Surgical Association at Jamestown, April 10, on "Injuries of the Hand." An afternoon session was devoted to round table discussions. —Dr. Cary Eggleston, New York, addressed the Medical Society of the County of Albany, April 23, on "Current Concepts of Coronary Artery Disease and Myocardial Infarction." —Dr. Howard T. Karsner, Cleveland, addressed the Onondaga County Medical Society in a joint meeting with Alpha Omega Alpha, Syracuse, April 1, on "Calcific Sclerosis of the Aortic Valve." —Dr. Varaztad H. Kazanjian, Boston, addressed a joint meeting of the Syracuse Academy of Medicine and the Eye, Ear, Nose and Throat Club, April 15, on "Traumatic Surgery of the Face and Jaws, Including War Injuries."

### New York City

**Personal.**—Dr. James L. McCartney, formerly with Sharp & Dolme, Philadelphia pharmaceutical manufacturers, has been appointed medical director of William R. Warner & Co., Inc., and associated organizations. —Dr. Paul W. Lapidus has been appointed adjunct professor of orthopedic surgery and assistant attending orthopedic surgeon in the New York Polyclinic Medical School and Hospital.

**Squibb Award Goes to Anatomist.**—Philip E. Smith, Ph.D., professor of anatomy at Columbia University College of Physicians and Surgeons, was presented with the annual Squibb Award during the session of the Association for the Study of Internal Secretions in Atlantic City, May 2-3. The award is given annually by E. R. Squibb and Sons to a "distinguished contributor to the field of endocrinology." Dr. Smith received his degree at Cornell University in 1910. He subsequently served on the faculties of Cornell, California and Stanford universities, becoming professor at Columbia in 1927.

### OHIO

**Alumni Reunion.**—The annual reunion of the Alumni Association of the University of Cincinnati College of Medicine will be held in Cincinnati, June 7. Hospital and clinic demonstrations will be presented during the day and the annual banquet will be held in the evening at the Sinton Hotel. The banquet speaker will be Dr. Clay Ray Murray, associate professor of surgery, Columbia University College of Physicians and Surgeons, New York. Following the banquet there will be a reception and dance in honor of the graduating class. Reservations should be made at the alumni office at the university or at the college of medicine. Dr. Mabel E. Gardner, Middletown, is president of the alumni association.

**Dr. Upham Retires as Dean.**—Dr. John H. J. Upham, dean of Ohio State University College of Medicine, Columbus, is to be the guest of honor at a testimonial dinner given June 6 at the Neil House by the faculty on the occasion of his retirement. Dr. Upham is retiring because of his retirement rule of the university. He first joined the faculty in 1897; in 1908 he became professor of medicine and served in that department until he was appointed dean in 1927. Dr. Upham has held many state and national medical offices. In Ohio he was president of the Columbus Academy of Medicine in 1919, president of the Ohio State Medical Association in 1914 and editor of the *Ohio State Medical Journal* from 1907 to 1913. Since 1913 he has been a member of the state board of medical examiners and since 1930 a member of the National Board of Medical Examiners. Dr. Upham was elected to the Judicial Council of the American Medical Association in 1922, then to the Board of Trustees in 1923, serving until 1935, the last two years of that period as chairman of the Board. He was President of the Association for the year 1937-1938.

### PENNSYLVANIA

**District Meeting.**—A meeting of the Seventh Councilor District of the Medical Society of the State of Pennsylvania was held in Williamsport, May 9, with Drs. David E. Hemington, Uniontown, and Walter C. Alvarez, Rochester, Minn., as speakers at the morning session on "Better Medical Care for Workers in Small Industries" and "Puzzling Types of Abdominal Pain" respectively. In the afternoon Dr. Alvarez addressed a joint meeting with the woman's auxiliary of the district on "Why Women Get Nervous." Fifty year awards were made by the president of the state society, Dr. Francis

F. Borzell, Philadelphia, to Drs. Oliver W. H. Glover, Laurelton, Robert B. Tule, Milton, and Lewis E. Wolfe, New Berlin. Dr. Borzell and Dr. Lewis T. Buckman, Wilkes-Barre, president-elect of the state society, discussed subjects of current interest.

#### Philadelphia

**Personal.**—Dr. Donald C. Smelzer, director of the Graduate Hospital of the University of Pennsylvania since 1930, will resign, June 1, to become managing director of the Germantown Dispensary and Hospital, according to *Modern Hospital*.

**Riesman Memorial Lecture.**—The Women's Medical Society of the University of Pennsylvania sponsored the Riesman Memorial Lecture at the University Hospital, May 1. The lecturer was Dr. Sara Murray Jordan, Boston, on "Problems in Modern Gastroenterology."

**Haden Society Exhibit.**—The Seymour Haden Society recently held its tenth annual exhibition at the University of Pennsylvania School of Medicine. Among the exhibitors were Drs. Isolde T. Zeckwer, Morton McCutcheon, Dale R. Coman and William G. Turnbull. The society was founded by Dr. Edward B. Krumbhaar, professor of pathology. At first the exhibitors were six members of the department of pathology; now members of other departments in the medical school and Philadelphia physicians not connected with the university participate. Originally etchings predominated in the exhibits, but this year oils and sculpture were most numerous.

**Lectures on Genetics.**—A volunteer lecture course on "Applied Medicogenetics" has recently been presented at the Woman's Medical College of Pennsylvania on Fridays. Clyde E. Keeler, Sc.D., fellow of the Wistar Institute of Anatomy and Biology, University of Pennsylvania, gave the first four addresses and later speakers were:

- Charles B. Davenport, Ph.D., Cold Spring Harbor, N. Y., Development of the Eugenic Movement.
- Dr. Elizabeth Kirk Rose, Philadelphia, Problems of Marriage and the Family as Met by the Physician.
- Dr. Madge T. Macklin, London, Ont., Case Histories from the Medicogenetic Consultation Room.
- Frederick Osborn, New York, A Permanent Eugenic Program for the United States.

#### TEXAS

**Personal.**—Dr. Sidney B. Hardy, who has been acting administrator of the Jefferson Davis Hospital, Houston, since the resignation of Dr. James H. Stephenson last year, has been appointed superintendent. — Dr. Charles H. McCollum Jr., Fort Worth, recently received the annual distinguished service award of the Fort Worth Junior Chamber of Commerce.

**Chemist Honored for Vitamin Research.**—Roger J. Williams, Ph.D., professor of chemistry at the University of Texas, Austin, received the \$1,000 Mead Johnson and Company prize awarded at the annual meeting of the American Institute of Nutrition in Chicago in April. Dr. Williams was honored "for his outstanding work on the isolation and identification of pantothenic acid." The prize is given for work on the vitamin B complex. Dr. Williams took his doctorate at the University of Chicago in 1919 and has taught chemistry at the University of Oregon and Oregon State College.

**Society News.**—Drs. Robert R. Shaw and Stuart A. Wallace, among others, addressed the Dallas County Medical Society, Dallas, April 24, on "Pulmonary Lobectomy and Pneumonectomy for Suppurative and Malignant Disease of the Lungs" and "Early Degenerative Lesions of the Pancreas" respectively. Drs. Charles L. Martin and Harry M. Spence, Dallas, were among the speakers, April 10, on "New Radiation Technic for Treatment of Metastatic Cervical Lymph Nodes" and "Surgical Treatment of Ureteral Stones" respectively. — Dr. Titus H. Harris, Galveston, addressed the Jefferson County Medical Society, Beaumont, April 14, on management of the nervous patient.

#### VIRGINIA

**Personal.**—Dr. Lee Scott Barksdale has resigned as health officer of Hopewell to enter private practice. — Dr. Guy C. Richardson, Bristol, recently received the distinguished service medal awarded annually by the Bristol Junior Chamber of Commerce to a citizen who has rendered noteworthy community service. — Dr. Julian T. Miller has resigned as health officer of Portsmouth.

**Medical College News.**—A bronze tablet commemorating the service of Base Hospital No. 45, known as the McGuire Unit, in France during World War I was recently presented to the Medical College of Virginia by the Base Hospital No. 45 Veterans' Association. Dr. William Lowndes

Peple, Richmond, made the presentation on behalf of Dr. Stuart McGuire, Richmond, commander of the unit, who was ill, to William T. Sanger, L.H.D., president of the college. The tablet was unveiled by Lockhart Beniss McGuire, a great-nephew of Dr. McGuire.

**State Health Officials Promoted.**—Dr. Adrian L. Carson Jr., acting head of the bureau of maternal and child health in the state department of health since the retirement of Dr. Bathurst B. Bagby in July 1940, has been made full director of that bureau, it is reported. Previously he was a member of the staff. Dr. Jack B. Porterfield, who has been state epidemiologist, has been appointed director of the bureau of industrial hygiene. He succeeds Dr. William D. Tillson, now of Parkersburg, W. Va., who resigned several months ago. Dr. Harry H. Henderson, Wheeling, W. Va., has been appointed state epidemiologist to succeed Dr. Porterfield.

#### GENERAL

**Medical Books in the Census of Manufactures.**—Books on medicine published in 1939 amounted to 1,868,892 volumes, according to the biennial census of manufactures conducted by the U. S. Bureau of the Census. The annual average since 1925 has been 1,725,000 volumes. The biggest year was 1937, when 3,923,532 volumes were published. The total number of all books published in 1939 was 180,142,492.

**Meeting of Radiologists.**—The American College of Radiology will hold its annual meeting at the Hotel Statler, Cleveland, June 4. Dr. Henry J. Walton, Baltimore, will deliver his presidential address at the banquet, following the business session. A feature of the banquet this year will be the presentation of the medal for distinguished contributions to radiology to Dr. William Edward Chamberlain, Philadelphia.

**Meeting of Postgraduate Committees.**—The fifth annual meeting of the Associated State Postgraduate Committees will be held, June 4, at the Hotel Statler, Cleveland. Discussion will be centered on the relation of postgraduate committees to intern instruction in nonteaching hospitals and the possible cooperation in such instruction by members of other organizations. A report on the question of national registry of postgraduate assemblies and a registry for postgraduate instructors will also be presented.

**Eradication of Brucellosis.**—Forty-five additional counties in thirteen states were declared practically free from brucellosis of cattle, April 1, by the U. S. Department of Agriculture. Counties now in the modified accredited status number three hundred and ninety-one in twenty-three states, the department announced. In the forty-five new counties approximately 533,000 cattle were tested. The greatest number, about 69,500, were in Polk County, Minn.

**American Orthopaedic Association.**—The annual meeting of the American Orthopaedic Association will be at the Hart House, University of Toronto, June 9-12, under the presidency of Dr. David E. Robertson, Toronto. Included among the speakers will be:

- Dr. Frederick R. Wilkinson, Toronto, Osteomyelitis, Recent Experience with Bacteriostatic Drugs.
- Dr. Stuart A. Thomson, Toronto, Treatment of Club Feet by the Use of Dennis Brown Splints.
- Dr. Joseph S. Barr, Boston, End Result Study of the Treatment of Idiopathic Scoliosis.
- Dr. LeRoy C. Abbott, San Francisco, Valgus Deformity of the Knee Resulting from Injury to the Lower Femoral Epiphysis.
- Dr. Halford Haddock, New York, Surgical Stabilization of Paralytic Dislocated Hips.
- Dr. Robert W. Johnson Jr., Baltimore, Treatment of Acute Osteomyelitis by the Sulfathiazole Drugs.
- Drs. Lloyd T. Brown and John G. Kuhns, Boston, Extension Deformities of the Cervical Spine.
- Dr. Dallas B. Phemister, Chicago, Resection and Transplantation in the Treatment of Bone Sarcomas.

**Painting on Yellow Fever Subject to Be Unveiled.**—A painting by Dean Cornwell, the third in the series "Pioneers of American Medicine," will be unveiled during special ceremonies in the Hotel Statler, Cleveland, June 2. The painting shows Major Walter Reed and Dr. Carlos Finlay with Major General Leonard Wood, Dr. Jesse W. Lazear, Dr. James Carroll and Dr. Aristides Agramonte, and John R. Kissinger, first volunteer soldier to be inoculated in the second set of yellow fever experiments. Miss Blossom Reed, daughter of Major Walter Reed, will unveil the painting. Mr. Cornwell chose the yellow fever subject at this time because of its significance in connection with national defense, since the Panama Canal would have been impossible without the success of Finlay and Reed. The series of paintings, depicting outstanding personalities and events in the history of American medicine, will take between ten and fifteen years to complete, one painting



being done a year. Finished paintings are lent to medical schools and medical societies. The first two were "Beaumont and St. Martin" and "Osler at Old Blockley."

**Ear, Nose and Throat Meeting.**—The American Laryngological, Rhinological and Otolological Society will hold its forty-seventh annual meeting at the Ambassador Hotel, Los Angeles, June 16-18, under the presidency of Dr. John MacKenzie Brown, Los Angeles. Speakers will include:

- Drs. Fred Z. Hayens and Edith M. Parkhill, Rochester, Minn., Malignant Tumors of the Larynx Other Than Squamous Cell Epitheliomas.
- Dr. Arthur C. Jones, Boise, Idaho, Report of Carcinoma in the Larynx in a Girl Aged Thirteen.
- Dr. Bert E. Hempstead, Rochester, Minn., Treatment and Prognosis of Aural Infections Complicated by Severe Diabetes.
- Dr. James Milton Robb, Detroit, A Consideration of the Endocrine Basis for Otitis Media (candidate's thesis).
- Dr. Robert C. Martin, San Francisco, Result of Extirpation of the Sphenopalatine Ganglion.
- Dr. Herbert Graebner, New York, Chemotherapy in Acute Nondiphtheritic Laryngotracheobronchitis.
- Dr. Emil F. Tholen, Los Angeles, Salivary Calculi.
- Dr. Kenneth M. Day, Pittsburgh, Primary Pseudocholesteatomas of the Ear.
- Dr. Gabriel Tucker, Philadelphia, Observations on the Interrelationship, Diagnosis and Treatment of Benign and Malignant Tumors of the Larynx, with Special Reference to the Prevention and Cure of Laryngeal Cancer.

**Directory of Medical Specialists.**—A second edition of the Directory of Medical Specialists has been authorized by the Advisory Board for Medical Specialties, to be ready for distribution in February 1942, with its contents complete to January 1. This directory is the official publication of the board and will list the names of approximately 18,000 diplomates of the fifteen American boards examining candidates for certification in the specialties. This is an increase of 4,000 over the first edition issued early in 1940. The geographic grouping will give completely revised biographic data about each diplomate; there is an alphabetical index with addresses and specialty designations, and the plan of organization, officers and examination requirements of each American board are fully outlined. Information not found in the old edition will be included in the new directory, such as details of formal training and military appointments. The only requisite to inclusion in the directory is formal certification by one of the examining boards. The publication is issued through the Columbia University Press of New York. The secretary of each specialty board serves on the Advisory Editorial Board and Dr. Paul Titus, 1015 Highland Building, Pittsburgh, of the American Board of Obstetrics and Gynecology is the directing editor.

**Association for Study of Allergy.**—The nineteenth annual meeting of the American Association for the Study of Allergy will be held at the Hotel Cleveland, Cleveland, June 2-3, under the presidency of Dr. Robert L. Benson, Portland, Ore., who will deliver his address Monday on "The Place of Allergy in Internal Medicine." The speakers will include:

- Drs. Samuel J. Levin, and Bertha Lillian Shulsky, Detroit, Serological Changes after Oral Ragweed Pollen Therapy in Children.
- Oren C. Durham, North Chicago, Ill., A Critical Interpretation of Data on the Incidence of Air-Borne Allergens.
- Drs. John M. Sheldon, John Harvey Johnston and Homer A. Howes and Norbert Fell, Ph.D., Ann Arbor, Mich., A Clinical Study of Histamine-Azo-Protein in Allergic Disease.
- Dr. Townsend B. Friedman, Dr. John A. Bigler and Marie A. Werner, Chicago, The Immunologic Response of Allergic Children to Toxoid.
- Dr. George F. Harsh and Paul B. Donovan, Ph.D., San Diego, Calif., Effect of Wide Variations in K and Na Intake in Asthmatic Patients.

A round table discussion will be held Tuesday afternoon on the use and misuse of drugs. In this group Drs. George Pinness, Los Angeles, and Warren T. Vaughan, Richmond, Va., discussing self-administered medication, will present, respectively, "Inhalation of Adrenalin and Benzedrine" and "Ephedrine and Synthetic Derivatives." Dr. Philip D. McMaster of the Rockefeller Institute for Medical Research, New York, has chosen for his subject as the banquet speaker "The Lymphatic Participation in Human Cutaneous Phenomena."

**Health Contest Winners Announced.**—Winning cities in the twelfth annual health contest conducted by the U. S. Chamber of Commerce in cooperation with the American Public Health Association and with the financial support of the Metropolitan Life Insurance Company were as follows: Baltimore; Evanston, Ill.; Greenwich, Conn.; Hackensack, N. J.; Hartford, Conn.; Honolulu, Hawaii; Madison, Wis.; Memphis, Tenn.; Newton, Mass.; and Pasadena, Calif. Winners in the seventh annual rural health contest were the following, chosen from three hundred and thirteen rural health units enrolled: Alcona-Ogemaw-Iosco-Oscoda counties and Alger-Schoolcraft counties in Michigan; Arlington County, Va.; Davidson County, Tenn.; Fayette County, Ky.; Forsyth County, N. C.; Coahoma County, Pike County and Lauderdale County, Miss.; Pickens County, Ala.; El Paso County and Tyler-Smith counties, Texas;

Thurston County, Wash., and Wasco County, Ore. The rural health contests are financed by the W. K. Kellogg Foundation of Battle Creek, Mich. In addition, special contests were held for noteworthy achievement in tuberculosis and syphilis control programs. Hartford, Conn., and Newton, Mass., won the contest for the most effective tuberculosis control programs, and the winners for the most effective syphilis control programs were Louisville, Ky.; Chicago; Memphis, Tenn., and Pasadena, Calif.

**American Radium Society.**—The twenty-sixth annual meeting of the American Radium Society will be held at the Hotel Cleveland, Cleveland, June 2-3, under the presidency of Dr. Frederick W. O'Brien, Boston. Speakers will include:

- Drs. John V. Blady and William Edward Chamberlain, Philadelphia, Five Year End Results in Intrinsic and Extrinsic Laryngeal Cancer.
- Drs. John E. Leach, Joseph H. Farrow, Frank W. Foote Jr., and Nestor William Wawro, New York, Fibrosis of the Lung Following X-Radiation for Breast Cancer.
- Dr. Shields Warren, Boston, Pathologic Aspects of Radiosensitivity of Malignant Tumors.
- L. D. Marinelli, M.A., New York, Dosage Determinations with Radioactive Isotopes.
- Helen Q. Woodard, Ph.D., and Dr. John M. Kenney, New York, Relation of Phosphatase Activity in Bone Tumors to the Deposition of Radioactive Phosphorus.
- Drs. Norman L. Higinbotham and Bradley L. Coley, New York, Effects of Preoperative Irradiation in the Treatment of Patients with Bone Sarcoma.
- Dr. Leroy Sante, St. Louis, Pneumoperitoneum as an Aid in Pelvic Irradiation.

The society will award the Janeway Medal to Dr. Edward H. Skinner, Kansas City, Mo., at the annual dinner Monday evening. Dr. Skinner will present the Janeway Lecture on "The Philosophy and Economics of Cancer." The Janeway lecturers are selected because of their outstanding scientific contributions.

**Meeting of Broncho-Esophagological Association.**—The twenty-fourth annual meeting of the American Broncho-Esophagological Association will be held at the Mid-Day Club, Cleveland, June 3, under the presidency of Dr. Gabriel Tucker, Philadelphia. Subjects to be discussed include:

- Dr. Carlos E. Pitkin, Cleveland, Repeated Severe Hemoptysis Necessitating Pulmonaryectomy.
- Dr. Albert H. Andrews Jr., Chicago, Functional Examination of Respiration in Obstructive Diseases.
- Dr. Arthur E. Hammond, Detroit, An Intratracheal Tumor Causing Severe Attacks of Dyspnea.
- Dr. Maurice Bonnier, Montreal, Canada, Some Interesting Endoscopic Foreign Body Cases.
- Dr. Burt R. Shurly, Detroit, A Foreign Body Retained Thirteen Years in the Bronchus.
- Dr. George W. Grier, Pittsburgh, Mediastinal Enlargement in Acute

Di Surgical Treatment of Carcinoma of

- Dr. Herman J. Moerssch, Rochester, Minn., Further Observations on the Treatment of Esophageal Varices by Injection of a Sclerosing Solution.
- Drs. Hugh G. Beatty and Dwight M. Palmer, Columbus, Ohio, Esophageal Neuroses.
- Dr. Edward B. Benedict, Boston, Carcinoma of the Esophagus with Special Reference to Treatment by Radical Surgery, X-Ray and Bougienage.
- Drs. Chevalier L. Jackson and Frank W. Konzelmann, Philadelphia, So-Called Adenoma of the Bronchus.
- Drs. Paul H. Holinger, Chicago, and Ralph G. Rigby, Council, Idaho, Bronchogenic Carcinoma Without Bronchial Obstruction.

**Special Society Elections.**—Dr. Jesse L. Bollman, Rochester, Minn., was elected president of the American Society for Experimental Pathology at its annual meeting in April; Dr. Baldwin H. E. W. Lucke, Philadelphia, vice president, and Dr. Harry P. Smith, Iowa City, secretary, reelected. Dr. Roscoe R. Graham, Toronto, was recently named president-elect of the Central Surgical Association at its inaugural meeting at the University of Michigan, Ann Arbor. Dr. Grover C. Penberthy, Detroit, was installed as president. Other officers include Drs. George M. Curtis, Columbus, Ohio, secretary; Henry K. Ransom, Ann Arbor, recorder; Max M. Zininger, Cincinnati, treasurer. The second meeting of the association will be held in Chicago, Feb. 27-28, 1942. The Central Surgical Association is designed particularly for a closer relationship of younger surgeons of the midwest and nearby Canadian provinces. Its principal founder was Dr. Roy D. McClure, Detroit, who was the first president of the group. The association was incorporated under the laws of Ohio, January 15. Its membership now totals one hundred and fifty members, including forty-seven founders, distributed over eleven states and three Canadian provinces. Dr. Samuel R. Haythorn, Pittsburgh, was elected president of the American Association of Pathologists and Bacteriologists at its annual meeting in New York, April 10. Other officers are Drs. Paul R. Cannon, Chicago, vice president; Howard T. Karsner, Cleveland, secretary, and Alan R. Moritz, Boston, treasurer. The next annual session will be held in St. Louis, April 2-3, 1942.



## Foreign Letters

### PARIS

(From Our Regular Correspondent)

April 6, 1941.

#### Invisible Dermatoses

In a recent paper before the Society of Dermatology, Gougerot justified the paradoxical use of the term "invisible dermatosis." He had in mind not so much cutaneous diseases which were invisible as those which exist in unperceived and attenuated form and are likely to become reactivated under changed conditions. This makes their early detection important. Wood's glass, infra-red photography, local leukodermia, pigmentation, ultraviolet irradiation, biopsy and local injections are among the diagnostic measures available. Invisible dermatoses are often associated with visible lesions. Their true nature is often disclosed under treatment and, like the original lesions, they yield to specific therapies. Pruritus, often observed in lichen planus as an isolated sign, can be cured by arsenic given internally and chrysophanic acid given externally. In eczema the harmful antigen induces an allergic pruritus. Some forms of dyshidrosis, urticaria and psoriasis reveal themselves in Wood's glass or by the use of eosin. Here the erythema of measles, scarlatina or syphilis is disclosed before it is seen with the eye. In leprids the injection of methylene blue stains the visible leprid at the same time that it discloses the presence of invisible maculae and is hence an excellent means for early diagnosis. Invisible pathologic phases have both a theoretical and a practical interest and open up questions of pathogenesis, early diagnosis, prognosis, therapy and prophylaxis, for example in eruptive fevers, and constitute one of the best tests of cure.

#### Procaine Hydrochloride in Disorders Involving the Cervical Sympathetic

According to Dos Ghallos, speaking before the Faculty of Medicine of Paris, the bronchopulmonary innervation is composed of a mass of terminal plexuses in the center of which are found the fibers of the vagus and two of the sympathetic. The lung is therefore a neurovascular organ. This is the reason why a therapeutic attack on the sympathetic seems indicated in many functional disorders of the lungs. In asthma, in the spasmodic cough of tuberculous persons, in bronchorrhea and in the bronchopneumonia of nurslings remedial action by way of the sympathetic may be obtained through the use of procaine hydrochloride. In pulmonary embolism this drug may save life. In asthma, dyspnea and stubborn cough it may have to be used for a longer time and may serve for functional exploration. The effect aimed at is neither sympathicolytic nor vagolytic; it seems rather directed against the peripheral neurohormonal system and to involve, for the most part, a modification of secretory processes.

The author employed procaine hydrochloride in about 200 cases of adults and nurslings and encountered only five failures. Successful injections provoke the Claude Bernard-Horner syndrome and hyperemia in the corresponding superior member as well as in the superior portion of the neighboring thorax. If inadvertently the brachial plexus or the pleural dome has been injured by the needle, a painful cough results, which merely requires the injection to be postponed to the next day. The same is true if a blood vessel is injured; in this case blood will show in the syringe. Some other accidents may also follow drug intoxication. Dos Ghallos does not agree with other investigators who, like White, believe that a combination of alcohol with procaine hydrochloride gives more enduring results. On the contrary, he considers the combination unreliable, dangerous and needlessly painful. His technic is based on that of Leriche.

While recognizing the value of procedures which allow reaching the stellate ganglion and the thoracic chain in its upper portion, Dos Ghallos prefers the upper external route of Arnulf, which permits simultaneous infiltration of the stellate ganglion and of the first three or four thoracic ganglions. Procaine hydrochloride is best injected bilaterally in one or two sessions. It is repeated more or less often in accordance with clinical indications, generally two or three times a week. The only contraindications are cardiac insufficiency, which complicates respiratory disorders, pulmonary suppuration and acute pulmonary edema.

### BRAZIL

(From Our Regular Correspondent)

March 31, 1941.

#### A New Antihemorrhagic Agent

Interesting work on snake venom has been done in São Paulo at the famous Butantan Institute. Among the properties of ophidian venom is the coagulating one described by Fontana in 1781. An application of this property for clinical purposes is being used according to the methods of Klobusitsky and König, who obtained the dissociation of the coagulating principles from the toxic ones of the venom. On this basis Eduardo Vaz and Anibal Pereira did experimental work at the Pinheiros Institute, employing a ferment extracted from the venom of species of the *Bothrops* type. It was demonstrated that the botropase is a therapeutic agent of great activity. Its coagulating effects are obtained by the use of small doses, of which the safe results are as satisfactory in rapidity as in duration. Several clinicians and surgeons confirmed the highly efficient action of the product. In view of this, botropase is widely used in Brazilian hospitals in all cases of hemorrhage. For an immediate effect, botropase can be injected intravenously in doses of 1 cc.; if there is danger of repetition of bleeding, 1 cc. should be injected subcutaneously at once. For prophylaxis a subcutaneous or intramuscular injection of 1 cc. should be given two to three hours before the surgical intervention.

Eduardo Vaz and Anibal Pereira read an article before the São Lucas Medical Society at São Paulo showing that the botropase is the best antihemorrhagic agent. Comparative experiments with other hemocoagulants proved that snake venom is superior, even when diluted 1:100 and used in a five times smaller volume than the others, which means five hundred times less.

The following conclusions were proposed:

1. By means of heating it is possible to separate the toxic from the hemocoagulant dose of the venom of *Bothrops jararaca*, thus allowing the use, devoid of danger, of a venom solution in the therapeutics of hemorrhages.

2. The heated solution, called botropase, does not alter the white corpuscles or the red ones, it shows no proteolytic properties in vitro and in vivo, and it does not cause local lesions or intoxications.

3. The hemocoagulating activity is extraordinary, 0.0002 cc. for the pigeon representing 0.0002 mg. of venom, which is a six thousand times smaller dose than the toxic one for this animal.

4. Botropase does not exhibit the negative phase which can be observed with other venom solutions.

#### Personal

The medical centers of São Paulo commemorated lately the professoral jubilee of Antonio Almeida Prado. All the medical societies held a solemn meeting, with the cooperation of the Faculty of Medicine and other official institutions. Professor Almeida Prado is well known by his works on mixed cerebellar syndromes and the publication of several medical books.

## NEWS FROM GERMANY

(Compiled from recent German periodicals)

## Matriculation of German Students

According to a decree, students of German origin within the conquered and annexed western provinces (Alsace, Lorraine and Luxembourg) are required to matriculate at certain designated universities. The explanation is that the difference in school systems under which the now repatriated students were taught does not fit in with the German pattern and requires the organization of introductory courses to prepare them for the German system. These introductory courses cannot be offered promiscuously. Hence Alsatian German students will matriculate in Frankfurt, Freiburg, Marburg and Tübingen; those from Lorraine in Heidelberg, Marburg and Leipzig, and those from Luxembourg in Bonn, Cologne, Giessen, Munich and Innsbruck. The decree will be effective until the beginning of the winter semester 1941-1942.

## Medical Education in Alsace as Seen Through German Eyes

In the *Deutsche medizinische Wochenschrift*, Babillotte compares the medical training at the university of Strasbourg, conducted according to the French university system, with that of the vaunted German system. The Alsatian university pattern is considered as conforming in organization and spirit to the secondary school system, in which attendance and progress are constantly checked and intellectual independence is inhibited. The French-Alsatian system was characterized by numerous tests and competitive examinations. This made it difficult for students to transfer to other universities, as is customary in Germany. The writer concedes that the French-Alsatian system kept the students "on their toes" and tended to prevent the development of academic hoboos such as used to be plentiful on German university campuses.

In the university of Strasbourg the medical curriculum was fully planned and had to be followed. Electives did not exist. A premedical year was devoted to physics, chemistry, botany and zoology. Clinical studies were begun in the second year. The student might also apply for assignment as assistant during the second year. During the third year the student had to be assigned as an assistant in surgery or internal medicine. Obligatory assistantship continued also through the fourth year. Final examinations were given on all subjects. Pharmacology, medical jurisprudence, psychiatry, therapeutics, hydrology and hygiene were reserved for the fifth year. The assistant served his time during this year in the ear and eye or the children's clinics. Final examinations were divided into three parts. The doctoral dissertation was generally prepared several years after the completion of the finals. The dissertation constituted the official medical diploma. Its recording by the health department signified admission to medical practice.

Great importance was attached to these assistantships, only twenty of which were available annually. These were awarded after competitive examinations based on histology, physiology and clinical subjects. Those selected were called externs and assisted in the wards, laboratories and at operations. After spending two years as an extern the student was admitted to competitive examinations, which qualified him for the internship (equivalent to the position of assistant physician in the German system). The salary was 500 francs (25 reichsmarks) with free board and lodging. The internship lasted four years. At the end of the four years one was eligible, if there was a vacancy, for the position as head of a clinic, which was good for two years. Vacancies were filled by appointment by the director of the clinic.

The author points out other deficiencies inherent in French universities, such as the statement that no provision was made for sports, good fellowship or social and political activities. His comment, however, is focused on the "ridiculous" system

of competitive examinations. One gets the impression that one is listening to a spokesman of a superior Nazi culture who has no understanding of the institutions of another people, intellectual though it may be, as are the French. It may be noted that Professor Leriche was for years head of the department of surgery of the university of Strasbourg. This university will now undergo a reform according to the Nazi pattern.

## Overcrowding in University of Oslo

Matriculation in the faculty of medicine of the University of Oslo has been such as to overtax lecture and training room facilities. Two hundred and sixty medical students, especially registrants for upper clinical courses, could not be accommodated. A number of German universities, such as Breslau, Leipzig, Freiburg and Erlangen, were opened to these students.

## Smoking by Female Technicians

Smoking by female technicians is animadverted on in a recent article in the *Female Technical Assistant*. The increasing use of tobacco with exposure to possible damage due to nicotine, it is pointed out, does not represent cooperation with the objectives for which the medical profession and the health authorities are striving.

## Police Order Regarding Abortifacients

A recent police order dealing with methods and means of preventing pregnancy and inducing abortion gives the authorities the power to proceed against those engaged in the manufacture, advertising and use of the most common abortifacients as well as against contraceptives detrimental to health.

## Blood Donor Center

A blood donor center has been organized in the Auguste-Victoria Hospital in Berlin. Suitable blood donors may be obtained by telephonic inquiry. The charge for individual service is 3 reichsmarks.

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Marriages

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CLIFTON JENNINGS DERRICK to Miss Elizabeth Russell McKenzie, both of West Palm Beach, Fla., in February.

BERLIN FRANCIS BARHAM to Miss Nancy E. McNeely, both of Winston-Salem, N. C., at Cooleemee in February.

RICHARD C. WOODSON to Miss Catherine Wall, both of Birmingham, Ala., in St. Augustine, Fla., February 8.

JOHN WILLIAM THURMOND, Augusta, Ga., to Miss Dora Elisabeth Tarver in Aiken, S. C., in March.

HOWARD WALTER BAKER, Philadelphia, to Miss Anna Marie Springer of Phoenixville, Pa., February 22.

WILLIAM H. FRIZELL to Miss Margaret Alexander, both of Brookhaven, Miss., in Meridian, March 16.

BENJAMIN FRANKLIN LOUNSBURY to Miss Elizabeth Shuman, both of Oak Park, Ill., in March.

JOHN FRANCIS REGISTER to Miss Margaret Lucette Brewer, both of Greensboro, N. C., February 15.

ROBERT F. SLOTTERBECK, Toledo, Ohio, to Miss Gertrude Cole of Washington, D. C., March 3.

EDWIN LAWRENCE KENDIG JR., Richmond, Va., to Miss Emily Parker of Appalachia in March.

JAMES B. HICKS, Gadsden, Ala., to Miss Dagny Magnhild Everson of Elliott, Mo., in February.

DAVID R. WEILL JR., Chattanooga, Tenn., to Miss Eva Ada Winkler in New York, March 2.

ALSTON CALLAHAN, Vicksburg, Miss., to Miss Eivor Holst of San Francisco, February 23.

HAIG CARAPETIAN to Miss Letitia Ingram Belknap, both of New York, February 15.

AARON W. NEWTON to Miss Marie C. Benson, both of Cleveland, in March.

BENJAMIN J. STEVENSON, Sparta, Ill., to Miss Nora Phagley of Modoc recently.

## Deaths

**Claude Thomas Wolfe** @ Louisville, Ky.; Kentucky School of Medicine, Louisville, 1907; clinical professor of ophthalmology at the University of Louisville School of Medicine; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; served during the World War; member of the staffs of the Norton Memorial Infirmary, Louisville City and Kentucky Baptist hospitals and St. Joseph Infirmary; consulting ophthalmologist at Kentucky School for the Blind; aged 57; died, April 9.

**Jefferson Davis Bloom**, New Orleans; Tulane University of Louisiana School of Medicine, New Orleans, 1886; professor of diseases of children during the years 1890, 1891 and 1892 at the New Orleans Polyclinic; fellow of the American College of Surgeons; consultant and honorary member of the staff of the Hotel Dieu, Sisters' Hospital; aged 79; died, March 21, of aspiration pneumonia and chronic myocarditis.

**Denis Roscoe Wolff** @ Greensboro, N. C.; Jefferson Medical College of Philadelphia, 1918; fellow of the American College of Surgeons; served during the World War; on the staffs of St. Leo's Hospital, L. Richardson Memorial Hospital and Piedmont Memorial Hospital; aged 44; died, March 23, in St. Anthony Hospital, St. Petersburg, Fla., of regional ileitis.

**Walter F. Enfield**, Bedford, Pa.; Medico-Chirurgical College of Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; at one time president of the Bedford County Medical Society; in 1923 member of the House of Delegates of the American Medical Association; aged 69; died, April 11, of carcinoma of the pancreas.

**Walter Herndon Nelson**, Silverton, Colo.; University of Texas School of Medicine, Galveston, 1935; member of the Colorado State Medical Society; on the staff of the Mercy Hospital, Durango, from 1937 to 1939; aged 35; died, March 13, in the Colorado General Hospital, Denver, of coronary thrombosis and cerebral embolism.

**Elisabeth A. Ryder**, Devon, Pa.; Woman's Medical College of Pennsylvania, Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; part owner and superintendent of the Alcluyd Hospital; aged 76; died, March 14, in the Bryn Mawr (Pa.) Hospital of hypertensive cardiovascular disease.

**Arnold Edgar Robison** @ Provo, Utah; University of Nebraska College of Medicine, Omaha, 1921; past president and secretary of the Utah County Medical Society; served during the World War; formerly city physician; aged 46; on the staff of the Utah Valley Hospital, where he died, March 23.

**Edwin Bannister Forbes** @ Detroit; Harvard Medical School, Boston, 1898; Medizinische Fakultät der Universität Wien, Austria, 1899; served during the World War; formerly county physician; aged 66; died, April 15, in the Harper Hospital of bronchopneumonia and carcinoma of the pharynx.

**William O'Gorman Quinby** @ Newark, N. J.; Columbia University College of Physicians and Surgeons, New York, 1900; member of the American Academy of Ophthalmology and Otolaryngology; served during the World War; aged 64; died, March 24, of coronary occlusion and arteriosclerosis.

**William Thomas McConville**, Honesdale, Pa.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1895; member of the Medical Society of the State of New York; served during the World War; aged 69; died, March 18, in a hospital at Goshen, N. Y.

**Llewellyn Powell**, Alexandria, Va.; George Washington University School of Medicine, Washington, D. C., 1904; member of the Medical Society of Virginia; city coroner; served during the World War; on the consulting staff of the Alexandria Hospital; aged 62; died, March 13.

**Henry John Heusinkveld** @ Fulton, Ill.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883; an Affiliate Fellow of the American Medical Association; for many years member of the board of education, and health officer; aged 81; died, March 13.

**Thomas Wilson Crowder**, Sherman, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1893; fellow of the American College of Surgeons; on the staff of St. Vincent's Hospital; aged 68; died, April 6, of gastric hemorrhage and heart disease.

**Pearl Suvilla Waters**, Patton, Calif.; Pulte Medical College, Cincinnati, 1910; member of the California Medical Association;

on the staff of the Patton State Hospital; aged 64; died, March 7, in St. Joseph Hospital, Orange, of carcinoma of the cervix.

**Ernest Robertson** @ Beaumont, Texas; University of Texas School of Medicine, Galveston, 1925; served during the World War; aged 41; on the staffs of St. Theres Hospital and the Hotel Dieu Hospital, where he died, March 19, of cerebral hemorrhage.

**John Horatio Dorsey**, Grantsville, Md.; University of Maryland School of Medicine, Baltimore, 1885; veteran of the Spanish-American War; at one time a member of the state legislature of Minnesota; aged 89; died, April 10, of chronic myocarditis.

**Edward Waddell Hooper**, Humboldt, Kan.; Drake University Medical Department, Des Moines, Iowa, 1898; member of the Kansas Medical Society; served during the World War; aged 64; died, March 7, of carcinoma of the stomach and liver.

**Albert Caleb Griffin**, Whitestone, N. Y.; Albany Medical College, 1880; College of Physicians and Surgeons, medical department of Columbia College, New York, 1881; aged 85; died, February 20, of coronary thrombosis and arteriosclerosis.

**Clifford Lombard Crittenden**, Detroit; Michigan College of Medicine and Surgery, Detroit, 1905; aged 69; on the staffs of the Harper Hospital and the Grace Hospital, where he died, April 6, of bronchopneumonia and cirrhosis of the liver.

**John Sherman Sprague**, Indianapolis; Medical College of Indiana, Indianapolis, 1905; member of the Indiana State Medical Association; on the staff of the Veterans Administration Facility; aged 63; died, March 27, in St. Joseph Hospital.

**Jonathan Arthur W. Burgess** @ Iowa Falls, Iowa; State University of Iowa College of Medicine, Iowa City, 1895; on the staff of the Ellsworth Municipal Hospital; aged 72; died, March 26, in Chicago of coronary thrombosis.

**Marie Lois Grote**, Topeka, Kan.; Northwestern University Woman's Medical School, Chicago, 1894; formerly on the staff of the Lincoln (Neb.) State Hospital; aged 79; died, February 17, of arteriosclerosis and bronchopneumonia.

**Frank Hinkley**, Brightwaters, N. Y.; Albany Medical College, 1898; member of the Medical Society of the State of New York; for many years on the staff of the Central Islip (N. Y.) State Hospital; aged 66; died, March 10.

**Robert Hebenstreit**, Buffalo; University of Buffalo School of Medicine, 1872; member of the Medical Society of the State of New York; aged 90; died, March 25, of bronchopneumonia and carcinoma of the bladder.

**James Burrow Edwards**, Fort Dodge, Kan.; Hospital College of Medicine, Louisville, Ky., 1898; member of the Kansas Medical Society; served during the World War; aged 73; died, April 4, of Parkinson's disease.

**William Ashford Sampson**, San Francisco; Hahnemann Medical College of the Pacific, San Francisco, 1909; served during the World War; aged 57; died, March 11, in the Veterans Administration Facility, Palo Alto.

**Arthur Whitaker Belting** @ Trenton, N. J.; Hahnemann Medical College and Hospital of Philadelphia, 1903; formerly secretary of the state board of medical examiners; aged 62; died, March 24, of coronary thrombosis.

**Harry Allen Sadden** @ Rochester, N. Y.; Syracuse University College of Medicine, 1908; served during the World War; on the staff of the Rochester General Hospital; aged 59; died, March 22, of acute leukemia.

**George Peter Sackrider**, Owosso, Mich.; Detroit College of Medicine, 1904; member of the Michigan State Medical Society; served during the World War; aged 66; died, March 11, of coronary occlusion.

**Kenneth Earl Shaweker**, Dover, Ohio; University and Bellevue Hospital Medical College, New York, 1914; fellow of the American College of Surgeons; served during the World War; aged 52; died, March 20.

**Liselotte Herz**, New York; Medizinische Fakultät der Universität Wien, Austria, 1938; intern at the Montefiore Hospital for Chronic Diseases; aged 26; died, March 18, of an overdose of sleeping tablets.

**George Arthur Huntley**, Branson, Mo.; University of Vermont College of Medicine, Burlington, 1897; for many years a medical missionary in China; aged 75; died, March 2, of myocarditis and influenza.

**Adolph George Rave**, Hicksville, N. Y.; Kentucky School of Medicine, Louisville, 1893; member of the Medical Society of the State of New York; aged 70; died, March 27, of arteriosclerosis and heart disease.

Eber Dunbar Kanaga, Palm Springs, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; member of the Washington State Medical Association; aged 63; died, March 31.

Ernest Choquette, St. Hilaire Village, Que., Canada; M.B., Laval University Faculty of Medicine, Quebec, 1884; M.D., Laval University Medical Faculty, Montreal, 1886; aged 78; died, March 29.

Fred Eli Redman, Washington, D. C.; Northwestern University Medical School, Chicago, 1907; served during the World War; on the staff of the Veterans Administration; aged 58; died, March 28.

John Lachlan MacIsaac, Antigonish, N. S., Canada; Baltimore Medical College, 1907; fellow of the American College of Surgeons; surgeon to St. Martha's Hospital; aged 71; died, March 25.

Ephym Efrem Syrkin, Brooklyn; Universität Bern Medizinische Fakultät, Switzerland, 1916; executive director of the Beth Moses Hospital; aged 52; died, March 26, of carcinoma of the larynx.

Oscar La Fayette Berdan, Strathroy, Ont., Canada; Trinity Medical College, Toronto, 1889; medical health officer of Strathroy; served during the World War; aged 72; died, March 3.

Harden T. Leach, Elston, Mo.; Washington University School of Medicine, 1896; member of the Missouri State Medical Association; aged 75; died, March 30, of arteriosclerosis.

Jesse M. Yonan, Chicago; Rush Medical College, Chicago, 1895; member of the Illinois State Medical Society; aged 73; died, March 13, of cerebral hemorrhage, arteriosclerosis and arthritis.

Harry Nalley, Mount Rainier, Md.; University of Maryland School of Medicine, Baltimore, 1900; member of the Medical and Chirurgical Faculty of Maryland; aged 64; died, February 7.

Israel Louis Feinberg, New York; University of the City of New York Medical Department, 1893; aged 70; died, April 13, in the Knickerbocker Hospital of cerebral hemorrhage.

James Walter Park, Kaufman, Texas; Louisville (Ky.) Medical College, 1880; member of the State Medical Association of Texas; aged 85; died, March 6, of coronary thrombosis.

Benjamin Franklin Babb, Ivor, Va.; University of Maryland School of Medicine, Baltimore, 1892; aged 76; died, March 31, in the Lakeview Hospital, Suffolk, of heart disease.

Abram M. Miller, Hyndman, Pa.; Baltimore Medical College, 1905; member of the Medical Society of the State of Pennsylvania; aged 71; died, March 4, of coronary thrombosis.

Thomas B. Perry, Miami, Fla.; College of Physicians and Surgeons, Baltimore, 1885; veteran of the Spanish-American War; aged 77; died, March 8, of acute dilatation of the heart.

William C. Watkins, Oconto, Wis.; Baltimore Medical College, 1905; member of the State Medical Society of Wisconsin; served during the World War; aged 61; died, March 19.

William H. Smith @ Cincinnati; Pulte Medical College, Cincinnati, 1896; on the staff of the Bethesda Hospital; aged 66; died, March 22, in Miami, Fla., of coronary thrombosis.

James Joseph Moorhead @ Terre Haute, Ind.; Rush Medical College, Chicago, 1895; on the staff of St. Anthony's Hospital; aged 78; died, March 16, of chronic myocarditis.

Archibald William Moss @ Binghamton, N. Y.; Long Island College Hospital, Brooklyn, 1921; aged 45; died, March 16, in Our Lady of Lourdes Hospital of cerebral embolism.

David Thomas Percy, Arlington, Mass.; Harvard Medical School, Boston, 1891; member of the New England Pediatric Society; aged 72; died, March 27, of coronary thrombosis.

John Robert Hendry, Detroit; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1922; aged 45; died, March 4, in the Harper Hospital of heart disease.

John Hunton Moss @ Binghamton, N. Y.; Jefferson Medical College of Philadelphia, 1914; served during the World War; aged 55; died, March 30, of coronary occlusion.

Rozilla Crofford, Burr Oak, Mich.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1886; Eclectic Medical Institute, Cincinnati, 1888; aged 80; died, March 31.

William Dalton Walker, Seattle; St. Louis University School of Medicine, 1903; aged 63; died, March 19, of pulmonary hemorrhage and dissecting aortic aneurysm.

James Taylor Walker, Richmond, Va.; College of Physicians and Surgeons, Baltimore, 1886; member of the Medical Society of Virginia; aged 81; died, March 12.

Robert Henry Montgomery, Detroit; Meharry Medical College, Nashville, Tenn., 1933; aged 34; died in March in the Grace Hospital of rheumatic heart disease.

John Henry Sullivan, Worcester, Mass.; Dartmouth Medical School, Hanover, N. H., 1894; aged 71; died, March 17, of arteriosclerosis and heart disease.

Stephen Summers Hanson, Haney, E. C., Canada; Western University Faculty of Medicine, London, Ont., 1893; aged 71; died, March 20, in Essondale.

John M. Fadeley, Point Pleasant, W. Va.; Maryland Medical College, Baltimore, 1905; county coroner; aged 63; died, April 10, of coronary thrombosis.

Richard Herrick @ Wyandot, Ill.; Eclectic Medical Institute, Cincinnati, 1891; served during the World War; aged 76; died, March 25, of chronic myocarditis.

George C. Merriam @ Empire, Ala.; Atlanta (Ga.) College of Physicians and Surgeons, 1902; aged 66; died, March 22, in the Norwood Hospital, Birmingham.

Chauncey Wyckoff Howell @ Grinnell, Iowa; Northwestern University Medical School, Chicago, 1911; aged 54; died, March 10, of myocarditis.

George Alfred Hull, New York; New York Homeopathic Medical College and Hospital, New York, 1889; also a dentist; aged 71; died, March 18.

William Burchett Page, Granville, Tenn.; University of Nashville Medical Department, 1871; aged 90; died, March 7, of cerebral hemorrhage.

Carlyle Raymond Jones, Atlantic, Iowa; John A. Creighton Medical College, Omaha, 1908; aged 59; died, March 8, of pulmonary embolus.

Penrose Harold Marquette, Shamokin, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1925; aged 41; died, March 23.

Edgar Holm @ Eureka, Calif.; Northwestern University Medical School, Chicago, 1903; aged 63; died, March 9, of coronary embolism.

Franklin May Sanders, Adamsville, Tenn. (licensed in Tennessee in 1926); served during the World War; aged 53; died, March 16.

Charles Benjamin Abbott, Hillsboro, N. H.; Dartmouth Medical School, Hanover, 1902; aged 68; died, March 24, of heart disease.

Silas Grant Wertz, Wilkesburg, Pa.; Jefferson Medical College of Philadelphia, 1895; aged 72; died, March 18, in Pittsburgh.

Colin Reed Weirich, Bridgeville, Pa.; Jefferson Medical College of Philadelphia, 1882; aged 83; died, March 11, of lobar pneumonia.

Peter Radebaugh, Sturgis, Mich.; Miami Medical College, Cincinnati, 1887; aged 87; died, March 23, of influenza and prostatitis.

William S. Windsor, Climax Springs, Mo.; University of Maryland School of Medicine, Baltimore, 1890; aged 79; died, March 14.

George John Ott @ Boston; Albany (N. Y.) Medical College, 1894; aged 73; died, March 29, of a staphylococcal infection.

James Hutchinson Bartley, Zillah, Wash.; Rush Medical College, Chicago, 1900; aged 69; died, February 12, of heart disease.

Lee Zuber, Sweet Home, Ark.; University of Arkansas School of Medicine, Little Rock, 1901; aged 75; died, March 3.

William M. Houghton, Floydada, Texas (licensed in Texas, under the Act of 1907); aged 73; died in March.

George W. Sisler, Tulsa, Okla. (licensed in Oklahoma in 1924); aged 77; died, March 23, of coronary thrombosis.

Edgar Browning, Sherbrooke, Que., Canada; M.R.C.S., England and L.R.C.P., London, 1887; died, February 5.

William Y. Corry, Vancouver, B. C., Canada; Detroit College of Medicine, 1897; aged 72; died, February 16.

Harry E. Mechling, Louisville, Ky.; Hospital College of Medicine, Louisville, 1900; aged 71; died in March.

Harley Parker, Chicago; Hering Medical College, Chicago, 1895; aged 66; died, March 3.

## Bureau of Investigation

### KOCH CANCER "CURE" AND THE CANADIAN CANCER COMMISSION

THE JOURNAL has frequently commented on the Koch cancer treatment. The Bureau of Investigation is in receipt of a letter dated April 2 addressed to a physician in Texas, from the Koch Laboratories of Detroit, carrying the signature "Wm. F. Koch, Ph.D., M.D.," which reads as follows:

"The CANADIAN CANCER COMMISSION appointed by the ONTARIO Government has compiled a splendid series of scientific PROOFS of the EFFICACY of the KOCH TREATMENT in curing advanced CANCER.

"In order to make this presentation available to interested physicians it is reproduced verbatim in a four hundred page book which is distributed for one dollar to cover printing and mailing costs.

"To give a practical conception of the clinical and scientific aspects of this work our book on natural immunity will be sent to you for the asking.

"Aside from humanitarian interest you will find that these books offer you a means of increasing your efficiency and income."

Of interest in connection with the claim made in the first paragraph is a clipping taken from the *Toronto Daily Star* for March 19, which deals with a report of the Ontario Cancer Commission, pointing out that this is the third report and that it has nothing to add to its November report in which it expressed the opinion that the investigation of "Ensol," the discovery of Dr. Hendry Connell of Kingston, Ont., "be continued," that they would be willing to consider "Essiac," sponsored by Miss Rene Caisse of Bracebridge, "if furnished with formula and samples," and continues as follows:

"Or Glyoxylide, sponsored by Dr. David Arnott of London, Ont., the Commission reports it 'is still hopeful that progress may be made . . . And thinks it desirable to defer any review of the evidence before it to date or the expression of any opinion until it either has the benefit of some laboratory study or it is finally successful in having an investigation made.'"

### CEASE AND DESIST ORDERS

#### Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicines or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission, by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable.

Abstracts of some of the orders issued during 1940 follow:

**Clito Products.**—There are two of these, designated as "Clito Emmenagogue Capsules" and "Rayo De Sol" and put out by a Rene P. Balditt, trading as the Clito Company, San Antonio, Texas. The Federal Trade Commission's investigation revealed that Rayo De Sol is not, as represented, a cure for cataracts, cloudy vision, film cataracts, ulcers and inflammation of the eyes, and that Clito Emmenagogue Capsules are not a safe and competent treatment for delayed menstruation. On Oct. 28, 1940, the Commission ordered Balditt to cease making these misrepresentations and to discontinue advertisements that fail to reveal that Clito Emmenagogue Capsules may cause gastro-intestinal disturbances and excessive congestion and hemorrhage of the pelvic organs and, in case of pregnancy, may cause uterine infection and blood poisoning.

**Concentra.**—A Chicago concern operating under the name Jean Ferrell, Inc., advertised this product as a highly concentrated food, safe for use and (with the addition of liquids) as constituting a balanced diet capable of replacing the ordinary diet. It was also claimed to supply deficiencies of the body, to correct overweight and underweight and to eliminate poisons from the kidneys because of its gravel root content, and poisons in general from the body by action of its rhubarb content. The Federal Trade Commission on March 15, 1940, ordered the concern to discontinue these representations, charging that they were exaggerated and untrue, that the preparation is not a food and that because of its high content of rhubarb, it is a drug and not safe to use. Jean Ferrell, Inc., was also ordered to cease disseminating advertisements of Concentra which fail to reveal that continued use of the preparation over a long period would cause excessive purgation and result in serious injury to the health of the user. Another federal agency, the Food and Drug Administration, prosecuted Jean Ferrell, Inc., for misrepresentation on the ground that the claims made in or on the trade package of Concentra violated the Food and Drugs Act in fraudulently representing, among other things, that this nostrum was a food, whereas it consisted essentially of a drug. This drug was reported by government chemists to be rhubarb root. Their analysis also disclosed the presence of some dried extractive material, soya bean tissues and Irish moss tissues. This case, designated as *Notice of Judgment 30606*, November 1939, was reported in *THE JOURNAL*, May 4, 1940, page 1825.

**Dermagell.**—This product, originally put out by Research Associates, Inc., Washington, D. C., was later taken over by Dermagell, Inc., of the same city. It was claimed to be "a 3-purpose Cleansing Cream and Shampoo—so efficient—so utterly different from anything heretofore obtainable that authorities proclaim it 'the discovery of the century' . . . soothes and heals as it penetrates innermost recesses of the tender pores without unpleasant reaction . . . actually protects your skin . . . prevents and cures many skin disorders." The Federal Trade Commission, on May 16, 1940, declared that this product is not substantially different from any other preparations or soaps designed for similar use, that it possesses no special soothing or healing properties and that other claims made for it were false and misleading. It therefore ordered that such misrepresentations be discontinued in the advertising.

**Faid.**—This item is put out by the Chapman Health Products Company of Cleveland, which also put out "N. A. R. Tablets." The tablets were represented as a cure or remedy for rheumatism, neuritis and arthritis, and "Faid," also known as "Daintee," as a cure or remedy and a safe, scientific treatment for obesity. The latter, according to the Federal Trade Commission, contained powdered extract of phytolacca berries, sodium borate, berberine hydrochloride, apocynoid (?) and desiccated thyroid, in quantities sufficient to cause serious and irreparable injury to health if taken under customary and usual conditions or under those prescribed in the advertising. The composition of the N. A. R. Tablets was not given. The Federal Trade Commission, on May 10, 1940, declared that the representations made for these two products were unwarranted and ordered them discontinued.

**Grape Cure for Cancer.**—This treatment was exploited by one Johanna Brandt in her book "The Grape Cure," distributed by a Jessie F. Springer, operating as the Harmony Centre of New York. The Federal Trade Commission objected to this book on the ground that it represented that Johanna Brandt had cured herself of cancer through the use of the system of treatment described therein, which is based on the use of grapes, and that this treatment would cure cancer and practically all other human afflictions. The advertising itself contained objectionable representations, such as that most diseases originate in the intestine and are caused by poisons due to uneliminated waste; that grapes dissolve mucus, that those who develop malignant growths have in most cases been suffering from constipation; that salt, inorganic drugs and "patent medicines" cause cancer and that the system or method of treatment outlined in the book will restore one's health. On March 15, 1940, the Commission ordered that such misrepresentations be discontinued. The American Medical Association's records indicate that back in 1928 Johanna Brandt, who claimed to have come from South Africa the previous year, was herself running the Harmony Healing Centre in New York, which concern was charged by state officials with practicing medicine without a license. Soon afterward one F. W. Collins, calling himself "dean" of the First National University of Naturopathy, Newark, N. J., announced that his institution had become the headquarters of the "Centre." Evidently the concern later was reopened in New York by Jessie Springer. It capitalized on the "grape cure" propaganda by advertising that it had grape juices and grape concentrates for sale, as well as various "health books." The authors of some of these books were readily recognized as quacks or food faddists.

**Nu-Myst.**—This nostrum, put out by the Forson Laboratories, Inc., New York, was described by the Federal Trade Commission as "a liquid composed of common ingredients prescribed by physicians for relieving 'colds,' and containing menthol, camphor, thymol, oil of pine, eucalyptol, benzyl benzoate and aromatics, with an alcohol base of 87 per cent." The Commission charged that the Forson concern—through radio broadcasts and newspaper and magazine advertisements—falsely represented that its product would bring speedy relief to sufferers from colds, hay fever, rose fever, asthma and other nasal and bronchial disorders. The Commission pointed out that the disorders named, except colds, are grouped under the so-called allergies, the causes of which are manifold, and since there are so many causes it is impossible for a formula such as "Nu-Myst" to bring relief from any of these conditions. On April 14, 1940, therefore, the Commission ordered the Forson people to cease and desist from representing that their preparation will destroy or prevent the growth of bacteria; that it is a cure or remedy for colds, whooping cough, hay fever, rose fever or asthma or that it is an effective treatment for relief of these ailments beyond such temporary relief as may be afforded by the temporary allaying of local irritation.



# BUREAU OF LEGAL MEDICINE AND LEGISLATION

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### BOARDS OF MEDICAL EXAMINERS BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, May 24, page 2425.

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, June 23-25. Part III. Various centers, June or July. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written*. Part I. Various centers, Nov. 1. Final date for filing application is Aug. 4. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written*. Nov. 3. Final date for filing application is Sept. 23. *Oral*. Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Oral*. June, in advance of the meeting of the American Medical Association. *Written*. Oct. 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: *Oral*. Philadelphia, June 6-7. Sec., Dr. R. Glen Spurling, 404 Brown Bldg., Louisville, Ky.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written*. Part I. or June. Final date for filing application is 90 days in advance of the examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral*. New York, June 2; Dr. John Green, 6830 Waterman Ave. St. Louis, March 7, 1942. Sec., AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January 2; Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 1640 State St., New Orleans, La.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 16-18. Final date for filing application is July 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: *Oral*. Boston, Oct. 7-8, imminent. *Written*. Locally, Aug. 22. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF RADIOLOGY: *Oral*. All groups. Cincinnati, Sept. 19-21. Final date for filing application is Aug. 1. Sec., Dr. Byrl R. Kirklind, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: Chicago, February. Final date for filing application is three months before date of examination. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

#### Pennsylvania January Report

The Pennsylvania State Board of Medical Examiners reports the written and practical examination for medical licensure held at Philadelphia, Jan. 7-11, 1941. The examination covered 5 subjects and included 50 questions. An average of 75 per cent was required to pass. Forty-nine candidates were examined, 47 of whom passed and 2 failed. Six physicians were examined by reciprocity and 1 physician so licensed by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

#### PASSED

School	Year Grad.	Number Passed
College of Medical Evangelists.....	(1940)	1
George Washington University School of Medicine.....	(1938)	1
University of Chicago, The School of Medicine.....	(1939)	1
Louisiana State University School of Medicine.....	(1939)	1
Johns Hopkins University School of Medicine.....	(1939)	1
Harvard Medical School.....	(1939)	1
University of Michigan Medical School.....	(1938)	1
St. Louis University School of Medicine.....	(1936)	1
Washington University School of Medicine.....	(1936)	1
Creighton University School of Medicine.....	(1939)	1
Cornell University School of Medicine.....	(1937)	1
New York University Medical College.....	(1935)	1
Western Reserve University School of Medicine.....	(1937)	1
Hahnemann Med. College and Hosp. of Philadelphia (1939, 9)	(1936)	1
Temple University School of Medicine (1936), (1937), (1938, 2), (1939, 3)	(1936)	9
Univ. of Pennsylvania School of Medicine.....	(1936), (1938, 2)	7
University of Pittsburgh School of Medicine.....	(1939, 2)	3
Medical College of Tennessee College of Medicine.....	(1939, 2)	2
University of Virginia.....	(1939)	1
Marquette University Department of Medicine.....	(1938)	1
Dalhousie University School of Medicine.....	(1938)	1
Queen's University Faculty of Medicine.....	(1940)	1
University of Toronto Faculty of Medicine.....	(1939)	1
McGill University Faculty of Medicine.....	(1937)	1
Medizinische Fakultät der Universität Wien.....	(1923), (1936)	2
Deutsche Universität Medizinische Fakultät, Prag.....	(1919, 2)	1
Université de Lausanne Faculté de Médecine.....	(1936)	2
School		1

#### FAILED

School	Year Grad.	Number Failed
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn.....	(1934)	1
Regia Università di Napoli Facoltà di Medicina e Chirurgia.....	(1938)	1

#### School

School	Year Grad.	Reciprocity with
Georgetown University School of Medicine.....	(1932)	Iowa
Loyola University School of Medicine.....	(1938)	Illinois
University of Michigan Medical School.....	(1936)	Michigan
Hahnemann Med. College and Hospital of Philadelphia (1934)	(1930)	New York
Medical College of Virginia.....	(1929)	W. Virginia
Yale University School of Medicine.....	(1937)	

#### LICENSED BY RECIPROCITY

#### LICENSED BY ENDORSEMENT

**Arizona January Report**  
The Arizona State Board of Medical Examiners reports the written examination for medical licensure held at Phoenix, Jan. 7-8, 1941. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. One candidate was examined and passed. One physician was licensed to practice medicine by reciprocity and 1 physician so licensed by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	Year Grad.	Per Cent
University of Kansas School of Medicine.....	(1938)	79.5
Stanford University School of Medicine.....	(1937)	
Woman's Medical College of Pennsylvania.....	(1935)	

#### PASSED

#### LICENSED BY RECIPROCITY

#### LICENSED BY ENDORSEMENT

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Malpractice: Osteomyelitis Attributed to Force Used by Physician in Restraining Patient.**—As the patient, a boy of 7 or 8 years of age, was being wheeled into the operating room preparatory to the removal of his adenoids by the defendant physician he became frightened and kicked a nurse in the stomach. The physician seized him by his arms and held him down on a table until the nurse administered ether. The following day finger marks were visible on the boy's skin at the upper end of the right humerus. About five days after the operation the child began to suffer from osteomyelitis of the upper right humerus. Attributing the osteomyelitis to the physician's grasping of the child's arm in the operating room, two suits were instituted against the physician, one by the child's father and the other on behalf of the child. The two suits were apparently consolidated for trial.

At the trial medical experts, apparently called by the physician, testified that although trauma with the presence of an infectious germ is an adequate cause for osteomyelitis, the source of osteomyelitis in the minor must be sought in some occurrence prior to the date of the operation, by which time the trouble was already in the process of development. To controvert this testimony, the plaintiffs called a general practitioner, testified that although trauma with the presence of an infectious germ is an adequate cause for osteomyelitis, the presence of an infectious organism in the system would be an adequate cause of osteomyelitis at the place of the trauma; and that the grasping of the boy's arm and forcing him down upon a table with sufficient force to leave finger marks would be adequate cause for the 'stretching of the capsule in the boy's arm at the glenoid fossa,' which condition was indicated in a roentgenogram that had been taken of the child. The court then refused to permit the witness to answer three hypothetical questions, one of which, in effect, would have called for his opinion as to whether or not the grasping of the boy's arms in the operating room was an adequate cause of the osteomyelitis;



another as to what caused the osteomyelitis; and the third as to whether a force sufficient to leave marks on the arm would, if there was some stretching of the capsule, be sufficient to cause osteomyelitis. From verdicts in favor of the physician the plaintiffs, in effect, appealed to the Supreme Judicial Court of Massachusetts, Worcester, claiming the trial court erred in refusing to permit the witness to answer the questions referred to.

The testimony of the witness called by the plaintiffs as an expert that was permitted in evidence, said the Supreme Judicial Court, made plain to the jury that the violent grasping of the boy's arms under the circumstances might produce osteomyelitis. It was not error for the trial court to exclude the opinion of the witness as to whether the osteomyelitis existing five days after the operation was or could be so caused. In his discretion the trial court might decide that the physician in question was not sufficiently versed in osteomyelitis to make his opinion valuable to the jury since the qualifications of an expert are to be determined by the trial judge, and his judgment is seldom overturned. The verdicts of the jury in favor of the defendant were not, in the opinion of the court, tainted by any error of law and were accordingly affirmed.—*Carboneau v. Lachance* (two cases), 29 N. E. (2d) 696 (Mass., 1940).

**Malpractice: Release of Hospital as Bar to Action Against Physician.**—The plaintiff's wife died, allegedly, from an overdose of paraldehyde, a narcotic administered for the purpose of producing "twilight sleep." The defendant, the attending physician, had prescribed the administration of 4 drachms (15 cc.) of the drug, but a nurse employed by the hospital gave the patient 4 ounces (120 cc.) instead. The plaintiff eventually made a settlement, in the amount of \$1,900, with the hospital owner, the settlement being based on the theory that the death was due to the negligence of the nurse employed by the hospital. The plaintiff then sued the defendant physician for damages for the wrongful death of his wife. From a judgment for the defendant in the trial court, the plaintiff appealed to the Supreme Court of Florida.

The defendant contended that he and the hospital, if guilty at all, were guilty as joint tortfeasors and that the release of the hospital owner barred the plaintiff from any further claims on account of his wife's death. The Supreme Court said that the theory of the release was that the death was caused by the hospital owner or her servant, the nurse who actually administered the drug, and that the theory of the present lawsuit was that the defendant physician was solely responsible for the death because he negligently prescribed the use of the drug and caused it to be administered. These theories were so inconsistent, held the court, that there could not be a recovery on both of them. Whether the hospital owner and the attending physician were joint or several tortfeasors, continued the court, the law would not permit the plaintiff to treat them as several for the purpose of making a settlement with one, as was done here, and then treat them as joint for the purpose of an action at law against the other to recover for the same wrong. The judgment in favor of the defendant physician was therefore affirmed.—*Sands v. Wilson*, 191 So. 21 (Fla., 1939).

**Workmen's Compensation Acts: Compensability of Diseases Contracted by Nurses and Interns.**—In three cases which arose in New York, the question concerned the application of the workmen's compensation act to certain diseases contracted by nurses and interns in the course of their duties. In the *Miller* case, the plaintiff was a student nurse and became disabled as the result of tuberculosis alleged to have been contracted as a result of the nature of her employment. While the claimant was unable to name any particular patient suffering from tuberculosis whom she attended, the record disclosed that an examination made at the time she entered the service established that she had no symptoms of the disease. There was medical testimony to the effect, too, that the claimant became infected subsequent to her admission as a nurse. The supreme court, appellate division, third department, affirmed an award of compensation in favor of the nurse, but the Court of Appeals reversed the award and remanded

the case to the industrial board for a further hearing on the ground that the evidence was insufficient to sustain the award. In the *Waterman* case, the supreme court, appellate division, third department, affirmed an award in favor of a nurse who contracted syphilis while caring for an infant suffering from congenital syphilis. In the *Turitto* case, the plaintiff was an intern who lost the sight of one eye because of gonorrheal ophthalmia contracted while attending a patient suffering from acute gonorrheal urethritis on whom an operation had been performed. The supreme court, appellate division, third department, affirmed the award of the industrial board in favor of the plaintiff.—*Miller v. City of New York et al.*, 14 N. Y. S. (2d) 680 (N. Y., 1939), 26 N. E. (2d) 821 (N. Y., 1940); *Waterman v. Jamaica Hospital et al.*, 14 N. Y. S. (2d) 636 (N. Y., 1939); *Turitto v. St. Mary's Hospital et al.*, 14 N. Y. S. (2d) 647 (N. Y., 1939).

**Dead Bodies: Disposal Must Not Offend Common Decency.**—The aged sister of the equally aged defendant with whom she had lived died following a fall. The defendant dragged the corpse down into the basement, built up a roaring fire in the furnace and shoved it gradually into the flames. A neighbor noticed a heavy, dark smoke with a rather disagreeable odor pouring from the chimney of the defendant's house and reported that fact to the police. A police officer was later sent to the defendant's home to make an investigation. The defendant took the officer down into the basement, scraped the ashes out of the furnace and said "If you want to see her, there she is." Only a few bones were found. The defendant was subsequently convicted of indecently and unlawfully disposing of his sister's dead body "to the great indecency of Christian burial," and he appealed to the Supreme Judicial Court of Maine.

It was conceded that the defendant had not committed an offense covered by any specific statute, but the state contended that he was guilty of a crime at common law. Any disposal of a dead body, said the Supreme Judicial Court, which is contrary to common decency is a crime at common law. The court could not agree with the defendant's argument that, because cremation is now a well recognized method of disposing of dead bodies and is not contrary to common decency, the defendant's burning of the dead body of his sister was not a crime. As was stated in *Reg. v. Price*, 12 Q. B. D. 247, ". . . a person who burns instead of burying a dead body does not commit a criminal act, unless he does it in such a manner as to amount to a public nuisance at common law." In the present case the offense was not that the body had been burned but that it had been indecently burned "in such a manner that, when the facts should in the natural course of events become known, the feelings and natural sentiments of the public would be outraged." The judgment of conviction was therefore affirmed.—*State v. Bradbury*, 9 A. (2d) 657 (Maine, 1939).

**Malpractice: Liability of Physician for Prenatal Injuries to Infant.**—The plaintiff, a girl aged 11 years, by her mother as guardian ad litem brought suit against the defendant physician for injuries sustained by her prior to her birth. She claimed that, because of the alleged negligent application of "metal clamps and forceps" by the defendant to assist him in delivering her prior to her birth, her "brain cells and spine" had been seriously injured resulting in permanent paralysis. She based her right of action on section 29 of the Civil Code of California, which provides: "A child conceived, but not yet born, is to be deemed an existing person, so far as may be necessary for its interests in the event of its subsequent birth." The plaintiff's mother was not personally a party to the suit. The trial court upheld the defendant's demurrer and rendered judgment in his favor. The plaintiff then appealed to the district court of appeal, third district, California.

The district court could not agree with the defendant's contention that the word "interests," as used in the statute just quoted, is limited in its application to a child's right of inheritance or to its property rights and does not give the plaintiff the right to maintain an action for tort committed on her prior to her birth. The language of the statute, said the court, is as

clear and concise as the English language can make it, and there is nothing to indicate that the word "interests" is not used in its general sense of anything that is profitable or beneficial to the child. The court held, therefore, that the statute was broad enough to include both personal rights and property rights.

The defendant's further contention, that the statute should be construed to be merely a continuation of the common law with respect to the rights of an unborn child, likewise did not meet with the court's approval. At common law the great weight of authority does hold that an unborn child has no existence as a human being separate from its mother and that therefore it has no right of action for personal injuries inflicted on it prior to its birth by the wrongful act of another. But the California statute in question is diametrically opposed to that common law theory because it declares that under certain circumstances an unborn child shall be deemed "an existing person." Certainly such a radical change from the common law rule cannot be considered a continuation of such rule. Since this statute considers an unborn child an existing person, after its birth its parents, by authority of section 376 of the California Code of Civil Procedure, have the right to maintain an action in the child's behalf for injuries sustained by it through the wrongful act or neglect of another. Furthermore, even at common law a distinction has often been drawn between an unborn child whose lungs and other organs are fully developed, so that it would be capable of living separate and apart from its mother, and one which is less developed. The language of some of the court decisions indicate that an action might lie for injury to an unborn child if it were viable at the time of the injury. The court remarked that in the present case there was no doubt that the child was viable and capable of existence separate and apart from its mother at the time of the alleged injury. It was fully developed in every respect. The injuries were alleged to have occurred in the very process of delivering the child.

We do not suggest, said the court, that the defendant in the present case was guilty of malpractice. It may be true that he made no mistake in the delivery of the child. Even if he did, a mere mistake in the judgment of a physician does not constitute malpractice. It may be impossible for the plaintiff to prove satisfactorily that the defendant's conduct contributed in any degree to her unfortunate condition, but the mere fact that the assumed wrong is not readily susceptible of proof should not deprive the plaintiff of her right to pursue a remedy for that assumed wrong.

The district court, therefore, reversed the judgment for the defendant and directed the trial court to overrule the demurrer and permit the defendant to answer. On appeal by the defendant to the Supreme Court of California the opinion and judgment of the district court were affirmed.—*Scott v. McPheeters*, 92 P. (2d) 678; 93 P. (2d) 562 (Calif., 1939).

#### Dental Practice Acts: Revocation of License for Unlawful Advertising—When "Harsh and Unreasonable."

—The defendant state board of registration and examination in dentistry of New Jersey on Jan. 4, 1939 formally charged the plaintiff, a licensed dentist, with having advertised in the Jan. 19, 1938 issue of the *Jersey Journal* "the prices and charges to be made for dental work . . . as well as the character and durability of said work" in violation of a New Jersey statute which prohibits advertising by dentists. The evidence showed that this was the only violation which the plaintiff had committed. After a hearing on a plea of guilty by the plaintiff, the board formally adopted a resolution, on March 24, 1939, revoking the plaintiff's license to practice dentistry. From the board's ruling the plaintiff appealed to the supreme court of New Jersey.

A New Jersey statute, said the supreme court, provides:

The [supreme] court may reverse or affirm in whole or in part the finding or determination of the board or pronounce such judgment on the evidence as shall be warranted.

The court held that under this statute it had the right to review the board's action and pronounce such judgment as it saw fit. The plaintiff's only contention was that the ruling of the board should be reversed because the revocation of his license was too harsh and unreasonable a penalty. The board, on the other hand, contended that the penalty was justified

because the plaintiff had twice been put on notice of the illegality of the act which he subsequently performed. In 1935, the United States Supreme Court, in *Scutler v. Oregon State Board of Dental Examiners*, 294 U. S. 608, 55 S. Ct. 570, 79 L. Ed. 1086, upheld the constitutionality of a statute similar to that which the plaintiff violated. In 1937, the supreme court of New Jersey, in a case decided by it, specifically directed the attention of the dental profession to the United States Supreme Court's decision. The board argued, in effect, that in view of these decisions the plaintiff had been amply warned of the possible consequences of his conduct. The supreme court pointed out, however, that the particular New Jersey statute in question was not upheld by the New Jersey courts until October 1938, nine months after the plaintiff's acts, and that it was not until a year after the plaintiff's acts that the board commenced its proceedings against him. This delay indicated to the court that there must have been some doubt even in the minds of the members of the board as to the validity of the statute, although they too were aware of the prior decisions. The court also called attention to the fact that the evidence showed that the plaintiff had practiced dentistry for sixteen years and had enjoyed a good reputation in that profession. In view of that evidence, plus the fact that the defendant was guilty of but a single violation, and the additional fact that no other violator had been penalized greater than by a thirty day suspension of his license, the court concluded that the penalty fixed by the board was unreasonably harsh and severe. Accordingly, the order of revocation of the plaintiff's license was reversed and an order of six months suspension entered.—*Schwartz v. State Board of Registration and Examination in Dentistry*, 15 A. (2d) 322 (New Jersey, 1940).

**Workmen's Compensation Acts: Chiropractic Adjustments as Medical Services.**—The sole question before the Supreme Court of Michigan in this case was whether or not chiropractic adjustments constituted "medical services" within the meaning of the workmen's compensation act. In the opinion of the court they did. While a chiropractor is not permitted to use the term "doctor," "physician" or "surgeon," he is nevertheless in Michigan held to be engaged in the "practice of medicine," even though his practice covers only a very restricted part of the general field of that practice. The court reasoned that since chiropractic manipulation is within the meaning of "practice of medicine," it is also within the meaning of "medical services." In answer to arguments pointing out the dangers in compelling employees to submit to treatment from chiropractors rather than from licensed physicians, the court disavowed any intention of holding that employees could be compelled to accept chiropractic treatment.—*Green v. Rawlings et al.*, 287 N. W. 557 (Mich., 1939).

## Society Proceedings

### COMING MEETINGS

American Medical Association, Cleveland, June 2-6. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Association for the Study of Allergy, Cleveland, June 2-3. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Tex., Secretary.

American Association for Thoracic Surgery, Toronto, Canada, June 9-11. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.

American Association of Medical Milk Commissions, Cleveland, June 1-2. Dr. Paul B. Cassidy, 2037 Pine St., Philadelphia, Secretary.

American Association on Mental Deficiency, Salt Lake City, June 20-24. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Broncho-Esophagological Association, Cleveland, June 3. Dr. Paul H. Holinger, 1150 North State St., Chicago, Secretary.

American College of Chest Physicians, Cleveland, May 31-June 2. Dr. Paul H. Holinger, 500 North Dearborn St., Chicago, Secretary.

American Laryngological, Rhinological and Otological Society, Los Angeles, June 16-18. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medical Women's Association, Cleveland, June 1-2. Dr. Eula Gray, 649 South Olive St., Los Angeles, Secretary.

American Neurological Association, Atlantic City, N. J., June 9-11. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., May 29-June 1. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Toronto, Canada, June 9-12. Dr. Charles W. Peabody, 474 Fisher Bldg., Detroit, Secretary.  
American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.  
American Proctologic Society, Cleveland, June 1-3. Dr. William H. Daniel, 1930 Wilshire Blvd., Los Angeles, Secretary.  
American Radium Society, Cleveland, June 2-3. Dr. William E. Costolow, 1407 South Hope St., Los Angeles, Secretary.  
American Rheumatism Association, Cleveland, June 2. Dr. A. R. Shands, Dupont Institute, Wilmington, Del., Secretary.  
American Society of Clinical Pathologists, Cleveland, May 29-June 2. Dr. A. S. Giordano, 531 North Main St., South Bend, Ind., Secretary.  
Association for Research in Ophthalmology, Cleveland, June 3. Dr. Conrad Berens, 35 East 70th Street, New York, Secretary.  
Idaho State Medical Association, Sun Valley, June 18-21. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.  
Maine Medical Association, York Harbor, June 22-24. Dr. Frederick R. Carter, 22 Arsenal St., Portland, Secretary.  
Montana, Medical Association of, Great Falls, June 24-26. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.  
Ohio State Medical Association, Cleveland, June 3. Mr. C. S. Nelson, 79 East State St., Columbus, Executive Secretary.  
Pacific Northwest Medical Association, Spokane, Wash., June 25-28. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.  
Utah State Medical Association, Salt Lake City, June 12-14. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

## CENTRAL SOCIETY FOR CLINICAL RESEARCH

*Thirteenth Annual Meeting, Held in Chicago, Nov. 1 and 2, 1940*

The President, DR. CHARLES A. DOAN, Columbus, Ohio,  
in the Chair

*(Concluded from page 2432)*

### Immune Response in Drug-Treated Patients with Pneumococcic Pneumonia

DRS. LUTHER L. TERRY, LAWRENCE D. THOMPSON and JOSEPH C. EDWARDS, St. Louis: This report embraces observations on the presence of agglutinins, mouse protective power and the polysaccharide cutaneous test in 77 patients treated with type specific serum and sulfapyridine; 36 patients treated with sulfapyridine and pneumococcus antigen; 14 patients treated with sulfapyridine alone, and 2 patients who entered the hospital after the crisis and consequently received no specific therapy. These 129 patients were distributed over types I, II, III, IV, V, VII and VIII; 112 of them recovered; 17 died. Observations are presented also on 4 cases of type XIV pneumonia in which only agglutinin studies and polysaccharide cutaneous tests were done as the type XIV pneumococcus is usually avirulent for mice.

Specific polysaccharide cutaneous tests were performed and specimens were secured for determination of agglutinins and mouse protective tests before therapy, three hours after serum therapy when serum was given, twenty-four hours after the beginning of any therapeutic measure and at two to five day intervals thereafter during hospital stay. The tests were also performed a short time before death on those patients who died.

Conclusions: 1. The type specific polysaccharide cutaneous test is a more reliable aid in prognosis than the mouse protective titer or the agglutinin concentration of the patient's serum, especially in those patients receiving adequate amounts of serum. 2. A limited number of observations indicated that the type specific polysaccharide cutaneous test is not passively transferred. 3. The combination of pneumococcus antigen with sulfapyridine resulted in a higher percentage of positive type specific polysaccharide cutaneous reactions, in more positive agglutinin reactions and in a higher mouse protective power than were observed in the limited number of cases (12) when sulfapyridine was used alone. 4. Patients with type III pneumonia are in a class distinct from others. The immune response as gaged by the tests in this study are not stimulated to the same degree as in other types of pneumonia. This may account in part for the lack of good response to drug therapy in many type III infections. 5. Death does occur in certain cases in spite of antibody response apparently adequate as far as can be determined by the observations indicated.

### Solubility Studies on Acetylsulfapyridine

DR. A. C. CURTIS and SIDNEY S. SOBIN, PH.D., Ann Arbor, Mich.: From the consideration of acetylsulfapyridine solubilities, hematuria (which may presage a dangerous or even fatal com-

plication) during the course of sulfapyridine therapy should be both predictable and preventable. Sample urines and prepared solutions of varying  $\mu$ n and specific gravity were tested for acetylsulfapyridine solubility. Roughly, the solubility increased with the specific gravity and the degree of alkalinity. The increase in solubility with increasing specific gravity may be in part related to concentration of urea.

Clinically, hematuria developing in patients receiving sulfapyridine at the University Hospital invariably occurred with limited fluid intake and a considerable prerenal deviation of fluid, insufficient alkali to produce an alkaline urine and a tendency toward acidosis consequent on self-imposed restrictions of food. More rigorous attention to urinary alkalinity by means of alkali administration, water balance and an adequate intake of food in patients with this type of therapy should be the rule.

Preliminary studies on acetylsulfathiazole show that its behavior is essentially like that of acetylsulfapyridine.

### Influence of Sulfathiazole, Sulfapyridine and Sulfanilamide on Experimental Infections in Mice

DR. MERLIN L. COOPER and H. M. KELLER, M.S., Cincinnati: All mice survived when fed, ad libitum, a complete diet containing 1 per cent of sulfathiazole two or more days before being inoculated with *Shigella paradysenteriae* Flexner. Ninety-five per cent of mice survived a minimum fatal dose of *S. paradysenteriae* Flexner when different groups of mice were given, three hours later, a single dose of 1 mg. by stomach tube of sulfathiazole, sulfapyridine, sulfanilamide and sulfamethylthiazole. Seventy-eight per cent survived 10 minimum fatal doses, 38 per cent survived 100 and 3 per cent survived 1,000 minimum fatal doses. Similar results were obtained with *Shigella paradysenteriae* Sonne and *Shigella alkaliseens*. Bacterial counts every three hours on the abdominal fluid and tail blood of infected mice showed that the counts in the untreated mice increased rapidly up to the time of death. In the mice treated with one dose of 2 mg. of sulfathiazole three hours after injection of the bacteria, the counts increased until six hours after administration of the drug, then rapidly decreased, and the mice recovered.

### Changes with Age in Embryonic Heart Action as Recorded in Micromoving Pictures

BRADLEY M. PATTEN, PH.D., Ann Arbor, Mich.: The subject matter for this talk has been selected from a series of studies carried out on embryos kept alive with the aid of specially constructed glass chambers and artificial nutrient mediums. By this method it is possible to keep the living heart under continuous observation for long periods and to study the changes in its activities which accompany its structural development. Inherent local differences in the rate of contraction and the direction of propagation of beat were recorded by means of micromoving pictures. By the use of three stage amplification, records were obtained showing the sequential appearance of first, a simple sinusoidal curve, then the ventricular and later the sinoatrial complexes of the electrocardiogram. Electrocardiograms of adult pattern were obtained from the embryonic heart before its nervous connections had been established and before any of the so-called conduction system became recognizable microscopically.

### Visualization of the Pulmonary Artery During Its Embolic Obstruction

DRS. JOSEPH H. JESSER and GEZA DE TARATS, Chicago: With a 25 per cent solution of sodium iodide, two hundred and sixty-three exposures were made in 48 dogs in various positions and at various intervals. The pattern of the vascular tree was studied before and after the production of massive and peripheral types of emboli. In massive pulmonary embolism, with total obstruction of the main pulmonary artery, not only the right side of the heart but the inferior vena cava and the hepatic veins were seen to be engorged. In the peripheral type of embolism, obstructing the blood supply of one lobe or even less pulmonary tissue, arterial spasm was demonstrated in other areas. Areas of localized emphysema, indicating incomplete bronchial obstruction, were visualized. The effect of papaverine on the pulmonary vascular bed was studied. The clinical significance of these studies was noted.

## DISCUSSION

DR. GEZA DE TAKATS, Chicago: It has been shown by post-mortem studies that patients will die an unexplained death with a small embolus in the lower lobes of the lungs without obstruction to the main artery. This is difficult to explain unless it is assumed that certain reflex changes originate from this embolus, either from the periphery or from the dilatation of the right side of the heart and particularly of the pulmonary artery itself. Pressor receptors have been shown to exist in the pulmonary artery. It is felt that if the pressure is raised in the pulmonary artery a depressor effect can be obtained in the systemic circulation. We have some experiments to show that a bronchial constriction occurs during pulmonary embolism which may be abolished by papaverine. This work shows that in addition to the bronchodilator effect of papaverine there is an effect on the vascular bed. On the basis of these studies we feel that the pulmonary vascular bed can constrict and dilate under nervous influence and that the effect of papaverine on the pulmonary embolism might be explained by the additional effect on the pulmonary vascular system. We are not convinced that papaverine is the optimal drug. We are hoping that a more potent and more effective vasodilator can be found.

DR. LOUIS N. KATZ, Chicago: Changes in caliber of the pulmonary tree demonstrated by Dr. Jesser's method may not be due to active dilatation of the pulmonary blood vessels but rather to a passive dilatation following increase in the intrapulmonary vascular pressure. Recently we have been studying the changes in blood pressure in the pulmonary arteries of unanesthetized dogs by use of a modification of the London cannula. With papaverine we found that pressure in the pulmonary artery goes up at the same time at which the systemic arterial pressure goes down. I wonder, therefore, whether the dilatation recorded by Jesser and de Takats may not be due to a passive phenomenon associated with an increase in pulmonary pressure. This is important in considering the use of papaverine in pulmonary embolism. It may be that the action of papaverine may be different when pulmonary embolism is present from what it is in the absence of embolism, particularly if a spasm of the remaining pulmonary vessels is produced by the embolus.

#### Induction of Puberal Changes in Young Women with Primary Amenorrhea

DRS. W. O. THOMPSON, S. G. TAYLOR III and PHEBE K. THOMPSON, Chicago: Observations have been made on the effect of various estrogenic materials in the treatment of young women who have not matured sexually and who present a syndrome corresponding to that observed in many eunuchoid males whose testes have not descended. In such women, large doses of estrogenic material produce (1) development of the secondary sexual characteristics of the female, including the growth of the external and internal genitalia, the development of the breasts, the growth of axillary and pubic hair and the onset of intermittent uterine bleeding resembling menstruation; (2) a moderate increase in body weight, most noticeable in the buttocks, thighs and hips, augmenting the feminine appearance; (3) an increase in muscular strength, bodily vigor and mental acumen and (4) an increase in sex consciousness with a corresponding change in emotional status.

## DISCUSSION

DR. C. M. MACBRYDE, St. Louis: It is known that the use of large doses of estrogenic material in experimental animals leads to damage to the ovaries which may be more or less permanent. That thought should be kept in mind when we treat eunuchoid persons. Perhaps it would be wise to emphasize the point that an attempt should be made to see whether stimulating therapy is effective; perhaps we have all been too eager to give up the stimulating therapy too soon. Do the changes Dr. Thompson and his associates produced disappear after treatment is discontinued, and must patients with this condition be treated indefinitely with estrogenic material to maintain the results as shown?

DR. S. G. TAYLOR III, Chicago: During the administration of stilbestrol the nipples of one of these patients became black, and a dark line developed between the umbilicus and the lower part of the abdomen in the midline. The umbilicus became deep black. There has been a slight decrease in this pigmentation during the

past month despite the continuation of treatment. I wonder if any one has an explanation.

DR. W. O. THOMPSON, Chicago: Damage to the ovaries as the result of administration of large doses of estrogenic material has been demonstrated, I think, and there is, of course, in the male damage to the testes as the result of administration of testis hormone, which may be so pronounced that spermatogenesis is abolished. The damage to the testes appears to be temporary, and recovery takes place when treatment is discontinued. All the patients I have shown received gonadotropic material which has been ineffective. There unfortunately is no gonadotropic material prepared from the pituitary gland itself that is of much clinical value. While we may have made an occasional woman menstruate during the administration of certain pituitary preparations, by and large all of them are of little value at the present time. The gonadotropic material from the serum of the pregnant mare is also a great disappointment. The most effective gonadotropic material available is that prepared from the urine of pregnant women, but its value in the female is still undetermined. It is not always easy to decide when hypogonadism is primary and when it is secondary. One of our eunuchoid men with both testes high in the inguinal canal has recently shown descent of both testes and genital growth with chorionic gonadotropin. The women reported in this study did not respond to the gonadotropic materials available now. While estrogens may theoretically damage the ovary, the changes produced were so striking that their use seems not only justifiable but desirable in women with primary amenorrhea. I should agree that it is a good therapeutic principle in hypogonadism to try the effect of stimulation therapy first and resort to substitution therapy if it fails.

DR. ELMER L. SEVRINGHAUS, Madison, Wis.: I think Dr. Thompson has made some statements that are too broad in his closing remarks. In his experience the serum from pregnant mares has been disappointing, but we have had distinctly good results with this type of thing. Dr. MacBryde reported another difficulty—that there is a time factor. We know that adolescence takes time and that an artificially produced adolescence takes time. If cases can be carried to the point of pregnancy and delivery I think it shows something can be done. Several of our cases have been successful in this sense.

DR. W. O. THOMPSON, Chicago: I am not entirely in agreement with Dr. Sevringhaus about the value of pituitary gonadotropin. It is of some interest that our third patient, who showed such striking development of secondary sexual characteristics during the administration of estrogenic material, had been treated by Dr. Sevringhaus for a year with a pituitary preparation without any effect.

#### The Peroral Use of Methyl Testosterone in Testicular Deficiency

DRS. E. PERRY McCULLAGH and H. R. ROSSMILLER, Cleveland: The clinical effects of methyl testosterone following its oral administration are compared with those of testosterone propionate administered by injection. The study is based on 19 cases. The drug has been administered over periods varying from a few weeks to ten months. The patients treated include some with severe prepubertal hypogonadism, primary pituitary disease with secondary hypogonadism and functional impotence. The observations indicate that methyl testosterone given perorally has a strong androgenic activity in that it produces in persons with androgenic deficiency a definite increase in the size of the penis and prostate gland, a general increase in body hair and increase in sexual potency. There is a striking increase in energy and endurance and the development of the typical aggressiveness of the normal male. The doses used have varied from 25 to 300 mg. daily. A gain in body weight of approximately 10 to 20 pounds (4.5 to 9 Kg.) within three weeks of beginning the administration of the drug has been noted. This is shown to be associated with retention of sodium, chloride and nitrogen. Consistent elevations in the basal metabolic rate have been seen after relatively large doses. Such increases in basal metabolism have amounted to as much as 54 per cent. Basal metabolic rates as high as plus 38 per cent have not been associated with the clinical picture of hyperthyroidism. The rate of growth may be greatly aug-

mented by the use of methyl testosterone. In 1 instance we have seen the growth rate increase from levels of 1 inch (2.5 cm.) a year before the age of 19 to 5½ inches (14 cm.) a year over a ten month period during the use of the drug. Continued large doses may cause oligospermia, such as has been reported after the use of testosterone propionate. An interesting side effect has been the development of gynecomastia in several of the cases.

## DISCUSSION

DR. M. A. BLANKENHORN, Cincinnati: Have the authors made a decision of what the total growth is going to be? Has the actual growth been increased or merely accelerated? Will there be a taller youth or will the youth have reached his height sooner in life?

DR. E. PERRY McCULLAGH, Cleveland: The two questions refer virtually to the same thing. We have been interested in the problem for a long time, and in one of our previous publications we purported to show that large doses of testosterone propionate given to certain persons did apparently cause a more rapid epiphyseal closure than had appeared previously and in 1 or 2 there was a more rapid than normal closure of the epiphyses. We do not know whether that will occur with this material or not. So far there is no evidence that it does, but it is a factor that must be considered seriously, because it may work just as do the hormones which are secreted in certain adrenal tumors, in which rapid growth is connected with rapid epiphyseal closure. Under these conditions persons grow more rapidly than normal, but the rate of epiphyseal closure not only exceeds normal but exceeds the growth rate as well, so that the individual affected is eventually shorter than normal. We have seen rapid growth of this type in 1 person, who is already 6 feet (182 cm.) tall. In such cases care should be taken not to continue growth unless the epiphyses can be closed at a rate which is parallel to the growth rate.

#### Effect of Extracts of Anterior Lobe of Pituitary Gland on Diabetes, Retarded Growth and Sexual Development

DRS. JAMES A. GREENE, L. E. JANUARY and L. W. SWANSON, Iowa City: The effect of administration of extracts of the anterior lobe of the pituitary gland has been observed in 3 patients with diabetes mellitus and dwarfism. The alterations produced in the calcium, phosphorus, nitrogen and sulfur metabolism, the growth rate, the sexual development and the diabetes were ascertained. The metabolic studies showed an immediate and a later effect of the extract. The growth rates increased and sexual development occurred. The diabetes was improved in the patient 26 years of age but was not altered in the two 17 and 18 years of age.

## DISCUSSION

DR. HENRY T. RICKETTS, Chicago: What extract was used and what was the dose? And was the extract tested in animals to determine whether it has a diabetogenic factor in large doses? I think it is interesting that the extracts which seemed to be effective in producing growth apparently did not affect the diabetes. I am not sure that the effect of the extract on growth has been clearly established. Children who have controlled diabetes may grow without anything else having been done. The first patient presented was sent home from the hospital and was supposed to be on good control while at home. However, he returned to the hospital with an increase in insulin requirement, having stopped taking pituitary extract and also stopped growing. Does this mean that the pituitary extract had been effectively used, or does it simply mean that the patient was a little lax in his diet at home and when admitted to the hospital was again controlled with large doses of insulin and, as would be expected, resumed growth?

DR. W. O. THOMPSON, Chicago: What pituitary extract was used? We have tried to produce growth in man with pituitary extracts and so far we have not been able to find one that definitely accomplishes this end.

DR. JAMES A. GREENE, Iowa City: The extracts used were those marketed by Parke, Davis & Co. What made our first patient's diabetes get better, I do not know. It is true that his diabetes got worse at home and was probably due to laxity

in the diet. We now have several patients with dwarfism who have grown; the oldest is a man aged 26 whom we have followed for four years. He has grown 3¼ inches (9.5 cm.), the epiphyses have closed, and he looks like a man now. One factor which has to be taken into consideration is that we have to give these extracts time to work.

#### Secretin in Determining Pancreatic Function

DR. H. M. POLLARD and LILA MILLER, PH.D., Ann Arbor, Mich.: By the use of secretin, pancreatic-duodenal juices have been secured and analyzed with respect to concentration of amylase, trypsin, bicarbonate, bile pigments and hydrogen ion concentration. Thirty-one persons were used as subjects to furnish data for the pancreatic response. They included a control group of 8 normal persons and in addition 5 patients with severe diabetes, 7 with carcinoma of the pancreas, 7 with pronounced cholecystic disease, 2 with stone of the common bile duct, and 2 with chronic pancreatitis. On the basis of these data, the value of this test as a diagnostic aid was considered.

## DISCUSSION

DR. HENRY T. RICKETTS, Chicago: A patient recently studied had severe general calcification of the pancreas with complete pancreatic achylia yet with his diabetes controlled by as little as 10 units of insulin. Therefore a disturbance of the external pancreatic function does not necessarily imply great severity of the diabetes itself.

DR. CLARENCE BERNSTEIN, Chicago: If there is a carcinoma in the body of the pancreas the external secretion may be disturbed, but in the cases of carcinoma of the head of the pancreas presented the figures show that there was much bile in all specimens of duodenal contents. Were these cases of completely obstructive jaundice and did they show jaundice clinically?

DR. WALTMAN WALTERS, Rochester, Minn.: Most of the obstructions caused by cancer of the head of the pancreas are not true anatomic obstructions but are functional. One can demonstrate that the lumen of the pancreatic portion of the common bile duct has been squeezed but not completely occluded by the tumor in the head of the pancreas. This squeezing is occasionally due to inflammation associated with the carcinoma. At the present time, in the management of lesions of the biliary tract errors sometimes occur in determining the presence or absence of associated chronic pancreatitis. The surgeon is dependent on the feeling of the pancreas to determine whether chronic pancreatitis is present. Postoperatively there is an opportunity to check the diagnosis by cholangiographic studies. If pancreatitis persists, its squeezing effect on the pancreatic portion of the common bile duct is apparent not only by the narrowing of its lumen and a persisting increase in the mid-portion of the duct but by delay in the emptying time of the duct as well. Improved tests of pancreatic function have been of considerable assistance in determining the presence of pancreatic disease. This has been true not only as far as the study of external pancreatic secretion itself following the intravenous injection of secretin, as originated by Lagerlöf, is concerned but also in the study of values for the activity of amylase and lipase in the serum, as Comfort and Osterberg have shown. These observers have found the values for amylase and lipase to be almost constantly elevated if determined within a few days after the onset of acute pancreatitis. The values for amylase usually return to normal within three or four days, whereas those for lipase may be elevated for as long as ten to fourteen days or longer after onset of the attack. Comfort and Osterberg have shown also that increased concentration of lipase in the serum in cases of obstructive jaundice denotes that the pancreas is involved in the process; if the clinical data point to malignant obstruction, the elevation of values for serum lipase localizes the malignant condition in the pancreas rather than in the biliary tract, for these authors have shown that normal values for serum lipase obtain almost universally in malignant lesions of the biliary tract.

DR. H. M. POLLARD, Ann Arbor, Mich.: The test requires much more study and analysis, especially on normal persons, before we shall be able to evaluate abnormal readings. In doing these thirty-one tests throughout last year, we utilized a full time chemist for the analyses, and, in addition, Dr. Miller and 1



devoted considerable time to the details of obtaining the samples and assisting in the analysis. Consequently at the present time I do not consider that the test is a simple one, but I am convinced that it offers valuable information. In answer to Dr. Bernstein, the patients who had carcinoma of the head of the pancreas with obstruction did show clinical jaundice. The cost of the material is still high, and I do not know of any other source than the one pharmaceutical house in Sweden. The suggestion of repeating the test after removal of the obstruction to the pancreatic duct is an excellent one. We have not done this but it would add positive information. The use of this test in evaluating the presence or absence of pancreatitis offers good theoretic possibilities, and we have been able to apply it in 2 cases with confirmatory results. I believe that the test has a definite value in evaluating associated pancreatic disease in the presence of severe disease of the gallbladder.

#### A Study of Gold Metabolism and the Fate of Gold Injected in the Treatment of Arthritis

DR. R. H. FREYBERG, W. D. BLOCK, PH.D., and O. H. BUCHANAN, M.S., Ann Arbor, Mich.: While patients with rheumatoid arthritis were receiving increasing amounts of either myochrysine, gold sodium thiosulfate or aurothioglucose at weekly intervals (for approximately six weeks), the concentration of gold in the blood and the urinary excretion of gold were measured daily by a new, highly sensitive, photoelectric colorimetric method. In addition, on the day of administration of the gold salt the content of gold in the blood and urine was determined one, two, four, six and twenty-four hours after injection. After the weekly dose of medicine became standardized similar determinations of gold were made at approximately monthly intervals throughout the period of treatment and for several months thereafter. Occasionally the concentrations of gold in synovial fluid and blood were measured simultaneously. In many other patients occasional determinations of gold in blood and urine were made during and after periods of chrysotherapy.

As the amount of gold salts administered was increased in the manner commonly employed, the blood concentration and urinary excretion of gold increased slightly but the elimination was much slower than the rate of administration, so that gold remained in the body in significant amounts often for months after its administration ceased.

#### DISCUSSION

DR. WALTER L. PALMER, Chicago: This last year we looked up the literature on gold therapy to see if there is any valid evidence that this new cure is better than any other new cure for arthritis. We were not able to convince ourselves that there is any real advantage in gold therapy over any other therapy, including psychotherapy. There is good evidence that gold therapy is dangerous and so, until we can prove that it has some value, it seems to me that the medical profession should not use it as generally as it is now being used. There came to our attention last spring a woman aged 47 who, because of mild arthritic symptoms, had been given by her physician four injections at weekly intervals of gold thiosulfate, 50 mg. a dose, receiving a total dose of 200 mg. She had no symptoms of toxicity until after the last injection. Six days after this last injection she suffered nausea and vomiting and diarrhea. These symptoms persisted for ten days. The patient was brought to the hospital in a stage of acute dehydration with profound diarrhea and died six days later. The autopsy showed extensive ulcerative gastroenteritis, particularly involving the ileum; the mucosa was entirely gone. Chemical studies disclosed the presence of gold in all tissues studied, particularly in the liver and spleen and intestine. The death occurred about three weeks after the last injection of gold, and all the symptoms occurred after the last injection.

DR. CARL V. MOORE, St. Louis: I was much interested in the appearance and increase of gold in plasma. Do the authors know in what form this gold is present? Is it hooked up, for instance, with the serum globulin?

DR. CLARENCE BERNSTEIN, Chicago: Could gold sulfide be recovered in the stool, and, if so, would this be a better indication that it had not been absorbed?

DR. CHARLES A. DOAN, Columbus, Ohio: What proportion of patients who tolerated this treatment seemed to be clinically improved? Has any type of allergic reaction been noted early in the course of gold therapy in those patients who did not tolerate it so well?

DR. CECIL STRIKER, Cincinnati: What is the time relationship between the injection of gold and the appearance of gold in the synovial fluid, and how long after injection is discontinued does the gold persist in the synovial fluid?

DR. R. H. FREYBERG, Ann Arbor, Mich.: Our paper is entitled "A Study of Gold Metabolism" and we did not plan to discuss the problem of clinical value. We prefaced this discussion with the statement that we had observed definite benefit which we thought was due to the use of gold salts, but we also observed reactions which were serious in some cases. We observed our patients carefully for a long time before gold therapy was used. We have seen many patients who, when given gold, had definite clinical benefit that persisted for as long as we have followed them, so we feel that gold therapy has value in some patients. I should like to know whether Dr. Palmer has observed many patients treated with gold when he questions its value. I questioned its value before I used it. In some patients there is no benefit. We do not recommend the use of gold salts by general practitioners as the treatment exists at present. Before we use gold salts we explain the situation and let the patient decide whether or not he wishes this form of treatment; we give an honest evaluation of the possibility of good and harm, and if he wants it used we employ it. We are extremely careful in its use and make frequent examinations of the blood and urine for any indication of intolerance. I am sure that if great caution is used intolerance will often be recognized and many serious reactions avoided. The length of time the drug is used, the dose and the route of administration are important with regard to reactions. We believe that intravenous administration is not the preferable route. We have not observed any benefit before six or eight weeks after treatment is begun; consequently we see no justification for the intravenous use of a drug which acts so slowly if it can be successfully administered by another route. On the basis of the results of our metabolic studies and because we have encountered more reactions with large doses of the drug, we are at present using doses smaller than are commonly employed. I am sure this is safer. In answer to Dr. Moore's question, we have not determined the form in which gold exists in the blood. We have separated the corpuscles from the plasma and then have found gold only in the plasma. We have to date used colloidal gold sulfide only by intramuscular and oral administration. Dr. Bernstein asked whether analyses have been done on feces. We are doing that now in our study of patients and have studied this in animals. We have found some gold in the feces of animals given gold salts intramuscularly, but whether after colloidal gold sulfide has been given orally there are significant amounts of gold in human feces needs to be determined. We have observed some patients soon after the drug has been given intravenously who show a relatively small amount of gold in the blood. Our studies on animals have shown that the reticuloendothelial cells of the liver and spleen take up gold when it is given as colloidal aurothioglucose, intramuscularly. We cannot answer Dr. Doan's question about the incidence of toxic reactions. We do not see a large number of patients. About 1 in 4 patients we treat with gold salts will not be able to tolerate the drug, but often we stop treatment on extremely slight evidence of intolerance. We estimate that about 75 per cent of the patients who have been able to tolerate the drug and who have continued treatment have been benefited by it.

#### Prevention of Peritonitis

DRS. J. A. BARGEN, W. J. TENNISON and C. F. DIXON, Rochester, Minn.: This is an analysis of the effect of antiperitonitis vaccine in 3,000 patients who had surgical procedures performed on the large intestine. A mixture of the green-producing streptococci and *Escherichia coli* have been used in a vaccine against peritonitis in patients who were to have intestinal operations since October 1928. The early impressions from the use of this vaccine as part of a preoperative program were favorable. In recent years a well controlled experiment has been



conducted in which every alternate patient who anticipated an intestinal operation received the vaccine.

#### DISCUSSION

DR. JOHN G. MATEER, Detroit: To what degree has the dose of the vaccine been reduced in order to avoid the more severe febrile reactions and the resulting higher mortality from subsequent peritonitis of patients having reactions of this type?

DR. GEORGE E. WAKERLIN, Chicago: Was there any preliminary experimental work on animals?

DR. J. A. BARGEN, Rochester, Minn.: Animal experiments were performed by Dr. Siegfried F. Herrmann at the Institute of Experimental Medicine under the direction of Dr. Mann. Extensive experiments were performed in which dogs were inoculated with fecal streptococci and *Esch. coli* intraperitoneally. After the injection of such a bacterin extensive intestinal operations were performed on the dogs. The incidence of fatal peritonitis in dogs so treated was low, whereas the incidence of peritonitis in a similar series of dogs which did not have the vaccine preoperatively was high. It was these striking results which led us to administer a similar vaccine to human beings before performing major intestinal operations. Reduction in fatal peritonitis in patients who have had such a bacterin has been striking. The problem has been studied from many different angles. There is a reduction in the total number of patients who have succumbed to peritonitis, there is a greatly reduced incidence of peritonitis when one considers the problem by operation, and there is a decided reduction in mortality when one considers the problem by surgeons who have operated. In reply to Dr. Mateer's question about the dose, I would say that a total of 1 cc. of a mixture consisting of equal parts of streptococci and *Esch. coli* suspended in 10 cc. of physiologic solution of sodium chloride is given intraperitoneally. Such a mixture will contain about 500 million of the killed streptococci and 500 million colon bacilli.

#### Circulating Blood Volume in Human Subjects Exposed to Hot Environments

DR. FORD K. HICK, NATHANIEL GLICKMAN, M.S., and DRs. M. M. MONTGOMERY and ROBERT W. KEETON, Chicago: Healthy medical students were the subjects of experiments. Under basal conditions an initial determination of the blood volume was carried out by the dye injection procedure (T1824) while the conditions were comfortable for the nude subject. On its completion the temperature was increased so that regulation of evaporative heat was dominant and after an appropriate length of exposure (one hundred to two hundred and fifty minutes) the determination of the blood volume was repeated.

After fairly short (one hundred minutes) exposure to a temperature of about 98 F. an increase in the volume of circulating blood has been observed amounting to 11 per cent, despite considerable loss of water from the body by evaporation. In a longer exposure to extremely hot conditions (112 F. for two hundred and twenty minutes), a fall of as much as 7 per cent in blood volume has been observed. After free sweating in hot conditions certain subjects showed no change in blood volume even after losing as much as 900 Gm. of water in sweating.

Changes in blood protein reflect the concentration and dilution of plasma implied. Leukocytes or red cell counts do not accurately indicate these adjustments.

Certain subjects, presumably more facile in their regulation of heat, can withdraw water for sweating from stores within the body without affecting the circulating body fluids.

#### DISCUSSION

DR. ROBERT W. KEETON, Chicago: Estimations of the plasma volumes from day to day do not always show the same values. The exposure of the body to warm environments causes a peripheral vascular dilatation and a transfer of blood from the interior of the body to the exterior. This is mirrored by the reduction of the blood in the lungs, as shown by the increase in the vital capacity. When a subject stands on his feet there is a decrease in the circulatory volume of blood, which returns to its original value after thirty to sixty minutes. All these facts indicate that there is a rather ready exchange between the volume of active circulating blood and the volume of reserve blood. The requisitioning of new supplies of blood from this source is one of the

first adjustments of the circulation to increased temperatures. This in turn leads to the conclusion that the blood volume is undergoing all the time phasic adjustments, and its value at any one time is dependent on the physiologic state of the person at the moment.

DR. GEORGE E. WAKERLIN, Chicago: Has Dr. Hick determined with what rapidity these changes occur in the normal human being?

DR. FORD K. HICK, Chicago: These changes take place in the human being rather rapidly within forty minutes or sooner. With regard to animal experiments on heat regulation, I do not believe there is any possibility of transmitting any data from animal to human physiology in such an experiment because of the difference in heat-regulating mechanisms.

#### The Clinical Value of Sleeping in the "Head Up" Position

DRs. A. R. MACLEAN and E. V. ALLEN, Rochester, Minn.: Man is one of the few animals which lead a life in two planes, the vertical during activity and the horizontal during sleep. As a result of this postural change, he is susceptible to ailments which have postural components. We have studied two such disorders, orthostatic hypotension and orthostatic tachycardia. Our studies indicate that therapeutic methods which diminish the range of postural change have a place in the treatment of these disorders.

In primary orthostatic hypotension, as well as in secondary orthostatic hypotension after extensive sympathectomy for essential hypertension, the use of the "head up" bed has resulted in great improvement in the arterial blood pressure in the erect posture. The symptoms of syncope and weakness in the erect posture have dramatically disappeared, and patients are capable of existing in the upright position during the day. However, sleep in a horizontal bed perpetuates the inability to stand erect or completely destroys the advantages gained by sleeping in the head up position.

Some patients with orthostatic tachycardia, a syndrome which in many instances is comparable to those designated as "effort syndrome," "irritable heart" or "neurocirculatory asthenia," have been relieved of their symptoms by sleeping in the head up position. Likewise some patients with hypertensive headaches which occur only at night have been benefited. Other conditions have been studied. The physiologic adjustments which follow this type of treatment are complex, but some of them are fairly well understood.

#### DISCUSSION

DR. JOHN W. SCOTT, Lexington, Ky.: Certain it is that since the days of early English physiologists we have always thought that man compensated for the upright position by splanchnic control, and yet, as I understand the paper, the authors assume that this has little or nothing to do with the relief of these patients but rather they ascribe it to a better return of venous blood. It seems to me difficult to understand why perhaps we all should not sleep upright. Would we be better off? We pay the price for the assumption of the upright position and I find great difficulty in explaining these interesting results the way the authors have done.

DR. E. V. ALLEN, Rochester, Minn.: This simple procedure will not benefit simple morning exhaustion without a postural component defined as orthostatic decrease in blood pressure. Moreover, in our experience it has not benefited 3 patients who have had epilepsy which occurred chiefly at night. It has benefited several patients who have headache on awakening or who are awakened by headache. It is important to remember that since patients who complain of morning exhaustion improve during the day subjectively and objectively the study of blood pressure and pulse rate must be carried out in the morning, for objective evidence which accounts for symptoms may be absent or minimal in the afternoon.

DR. J. DEWEY BISGARD, Omaha: Often normal surgical patients, when first getting out of bed after an operation, complain of dizziness and may collapse with a big fall in blood pressure as do patients with postural hypotension. Those patients kept in Fowler's position after operation have fewer of these symptoms than do those kept flat in bed.

Dr. A. R. McLEAN, Rochester, Minn.: Our conception of orthostatic hypotension has changed significantly. We previously thought that the hypotension represented a disturbance of the sympathetic nervous system. We now feel that the drop in blood pressure is merely a secondary phenomenon resulting from diminished return of venous blood. This defect in return of venous blood can be demonstrated by the Flack test. The evidence of a disturbance in the autonomic nervous system had been the lack of a cardiac accelerating mechanism, a deficiency in sweating and the drop in blood pressure on standing. In our cases of orthostatic hypotension we have been able to demonstrate normal arteriolar reflex vasoconstriction and vasodilatation as a result of changes in environmental temperature. In 1 case, in which remarkable improvement occurred from the use of a head up bed, we have been able to demonstrate the reestablishment of normal sweating. It appears to us that in cases of orthostatic tachycardia orthostatic hypotension would develop if the cardiac accelerating mechanism failed.

#### Rate of Diodrast Excretion During Intravenous Urography as a Test of Renal Function

DRS. JOSEPH C. EDWARDS, THOMAS FINDLEY and H. L. WHITE, St. Louis: The large amount of diodrast required intravenously for roentgen visualization of the renal pelvis imposes a far heavier load on the function of tubules than do the amounts of phenol red and other dyes in common use. The iodine method of White and Rolf has been made suitable for routine office use, and the amount of diodrast excreted during the thirty minutes following injection has been compared with simultaneous urea clearance. Normal adults excrete about 40 per cent of the injected iodine under the conditions usually employed in pyelography. The effects of dehydration, fasting and pitressin have been examined, and normal value has been established in adults for the usual quantities of both diodrast and diodrast compound. The test measures neither the flow of renal plasma nor the  $T_m$  (maximal tubular excretion) value of Smith but appears to be a valuable addition to urologic technic because it is fully as sensitive as urea clearance, requires no complicated analytic procedure and imposes no additional expense or inconvenience to the patient undergoing roentgen study.

A group of twenty-eight City Hospital interns and Washington University Medical School students were studied as a normal group. All had normal urea clearances, blood pressures, blood urea nitrogen levels and urine.

A group of 12 patients with various degrees of essential hypertension, chronic glomerular nephritis and cardiac decompensation were studied. Urea clearances were performed simultaneously in 2 normal and 3 abnormal patients. Diodrast inulin clearances were also done and were well correlated with the diodrast iodine excretions in the thirty minute period. The blood iodine is at maximal tubular excretion for the first fifteen or twenty minutes of the test.

The abnormal group excreted about 30 per cent of 2.3 Gm. of iodine injected as 20 cc. of diodrast in thirty minutes, while the normal was 40 per cent. The worse the renal function, the less iodine there was excreted. There was comparatively little difference among tests done before breakfast (during fasting) and those done after the subjects had food.

The effect of pitressin decreased the urea clearance without appreciably affecting the excretion of diodrast.

#### Excretion of Porphyrin in the Urine in Alcoholic Cirrhosis and After Episodes of Hepatic Coma

DR. SAMUEL NESBITT, Rochester, Minn.: During a qualitative and quantitative study of the excretion of ether-soluble porphyrin in the urine of patients suffering from a variety of hepatic diseases, 4 instances of severe alcoholic cirrhosis of the liver were encountered. The persons concerned were observed for extended periods during which they exhibited repeated transient episodes of neurologic manifestations ranging from confusion and mild psychotic states, sometimes with pathologic neurologic signs, to deep hepatic coma. By means of daily quantitative determinations it was ascertained that these patients excreted abnormally large amounts of coproporphyrin in their urine and that this value was diminished before and during

periods of acute hepatic insufficiency, only to be abruptly increased as the patient emerged from the acute episode. The porphyrin has been isolated and identified as coproporphyrin I and III.

#### DISCUSSION

DR. C. J. WATSON, Minneapolis: I agree that the variation in the excretion of porphyrin in these cases represents a variation in clearance. These patients have profound hepatic damage with suppression of renal function. We have seen a similar example in a patient with acute porphyria excreting large amounts of the zinc complex of uroporphyrin. This patient was admitted to the hospital with severe abdominal colic, severe vomiting and moderate dehydration. During the first twenty-four hours the urinary output was 160 cc.; this increased rapidly, probably as a result of the parenteral administration of fluids and dextrose. With this there was an increase in the output of the zinc complex from 10 mg. during the initial phase to 90 mg. when the fluids had increased. In the past it has been customary to determine simply the total excretion of coproporphyrin in the urine. Our information so far has concerned only the values for the total of the two isomers. In the future increased importance will undoubtedly become attached to the ratio between isomer types I and III in the urine and feces since it is certain that coproporphyrin I has significance entirely different from that of the type III isomer. The synthesis of the type I isomer is independent of hemoglobin synthesis, although the available evidence indicates that the formation of type I is related in some way to the rate of erythropoiesis in the bone marrow. Therefore it is not surprising that patients with cirrhosis who have a red bone marrow and not infrequently have at least a mild increase in the rate of destruction of the blood should exhibit increased formation and excretion of the type I isomer. Also, because of the hepatic damage, there is a shunt of the coproporphyrin I into the urine so that with cirrhosis of the liver we commonly encounter increased type I in the urine. This is comparable to urobilinogen excretion in similar cases. Patients with macrocytic anemia with excessive amounts of urobilinogen in the feces and large amounts in the urine have an oversupply of the substance with inability of the liver to handle the amounts returned to it. The question of significance of the type III isomer is more difficult of interpretation. On theoretic grounds the formation of this isomer could be regarded as related to the formation or destruction of hemoglobin. There is no evidence that coproporphyrin III is formed during the simple destruction of hemoglobin, but there is much evidence that it is formed when there is a disturbance of the formation of hemoglobin in the bone marrow, as in lead poisoning or other types of poisoning. It is of interest that some patients with cirrhosis have been noted to have a predominance of type III in the urine. Most patients, it is true, excrete chiefly the type I isomer. The fact that excretion of type III has been noted in some and that this is most often associated with some form of poisoning may provide a means in the future of obtaining more information about the etiology of hepatic cirrhosis.

DR. HUGH R. BUTT, Rochester, Minn.: Were vitamin supplements given and, if so, was there any apparent effect on the excretion of porphyrin?

DR. SAMUEL NESBITT, Rochester, Minn.: It is interesting that these patients did recover from such acute episodes, and this may be attributed to the intensive vitamin therapy, since that was the one innovation in their medical care. The routine management always included vitamin supplements, and at the first appearance of what might suggest the onset of such an acute episode of hepatic insufficiency intensive vitamin therapy was instituted which included the daily intravenous administration of at least 100 mg. of nicotinic acid, 100 mg. of thiamine hydrochloride, 100 mg. of ascorbic acid and 1 to 2 mg. of a vitamin K preparation. We were never able to demonstrate to our satisfaction that any one of these vitamins or any combination of them produced any decrease in the excretion of porphyrin in the urine of many patients having various diseases of the liver. When the particular patients were receiving the most intensive vitamin therapy and after they had responded to treatment, the excretion of porphyrin in the urine was abruptly increased.

# Current Medical Literature

## CURRENT MEDICAL LITERATURE

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### AMERICAN

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Titles marked with an asterisk (\*) are abstracted below.

### Alabama State Medical Assn. Journal, Montgomery 10:257-292 (Feb.) 1941

- Treatment of Acute Intestinal Obstruction. F. K. Boland, Atlanta, Ga.—p. 257.
- Urinary Lithiasis. J. U. Reaves, Mobile.—p. 261.
- Syphilis: Control Program in a Mining Community. R. L. Stewart, Acm.—p. 265.
- Diagnosis and Treatment of Coronary Occlusion. J. C. Gladney, Jasper.—p. 267.
- Discussion of Hydatidiform Mole. T. M. Boulware, Birmingham.—p. 269.
- Role of Allergy in Pediatric Practice. A. C. Gipson, Gadsden.—p. 272.
- Carbuncle of Face, Septicemia and Pulmonary Abscess: Recovery Following Sodium Sulfathiazole Intravenously: Case Report. T. F. Scofield, Birmingham.—p. 274.

### American Heart Journal, St. Louis 21:133-256 (Feb.) 1941

- Preliminary Investigation of Therapeutic Value of Lanatoside C (Digilamid C). G. Fahr and J. LaDue, Minneapolis.—p. 133.
- Calibrated Phonocardiography: New Technique for Clinical Use. E. C. Mannheim, Stockholm, Sweden.—p. 151.
- \*Hemoptysis in Rheumatic Heart Disease. L. Wolff and H. B. Levine, Boston.—p. 163.
- Form of Volume Pulse in Finger Pad in Health, Arteriosclerosis and Hypertension. J. B. Dillon and A. B. Hertzman, St. Louis.—p. 172.
- Spontaneous Volume Changes in Extremities. D. I. Abramson and K. H. Katzenstein, with assistance of Fanny A. Senior, Cincinnati.—p. 191.
- Effects of Nitrites and Xanthines on Coronary Inflow and Blood Pressure in Anesthetized Dogs. N. H. Boyer and H. D. Green, Cleveland.—p. 199.
- Relationships of Lead I, Chest Leads from C<sub>1</sub>, C<sub>2</sub> and C<sub>3</sub> Positions and Certain Leads Made from Each Shoulder Region: Bearing of These Observations on Einthoven Equilateral Triangle Hypothesis and on Formation of Lead I. C. C. Wolferth, Mary Miller Livezey and on Wood, Philadelphia.—p. 215.
- Use of Cathode Ray for Recording Heart Sounds and Vibrations: III. Total Cardiac Vibrations in 100 Normal Subjects. J. R. Smith, J. C. Edwards and W. B. Kountz, St. Louis.—p. 228.

**Hemoptysis in Rheumatic Heart Disease.**—Wolff and Levine state that among the 521 patients with rheumatic heart disease admitted to the Beth Israel Hospital between 1928 and 1937 inclusive 50 had hemoptysis prior to admission or during hospitalization. The symptoms associated with the hemoptysis varied; some patients had none, others complained of pain in the chest, palpitation, dyspnea, cyanosis, wheezing, acute pulmonary edema, weakness, faintness and collapse. The three most common symptoms were palpitation, pain in the chest and dyspnea. The average age of the patients was 33.4 years; the youngest patient was 14 and the oldest was 54. Mitral stenosis was present in every case (except one, in which the hemorrhage was caused by a lung abscess), pulmonary infarction was diagnosed in 23 and, prior to the onset of hemoptysis, congestive failure was present in only 8 cases. The hemorrhage was accounted for by pulmonary infarction in almost half of the patients. Pulmonary infarction was found in 7 of the 8 cases of congestive failure and in only 2 of the 9 cases in which the size of the heart was normal. Following the initial hemoptysis many months and, at postmortem examination of one of them, pulmonary arteriosclerosis and multiple thrombosis were found. Pulmonary infarction is the most likely cause of hemoptysis in the presence of congestive failure, but if the patient has no cardiac enlargement it can be excluded. If pulmonary enlargement is present in the absence of cardiac enlargement, and particularly if hemoptysis is followed by a progressive increase in the size of the heart, pulmonary arteriosclerosis may be the underlying cause. In most of the remaining cases the hemoptysis was caused by mitral stenosis alone, without gross evidence of congestive failure. Hemorrhage may be caused by active

rheumatic infection. There was such evidence in 12 cases. When hemoptysis occurs in a case of rheumatic heart disease and intercurrent pulmonary disease and left ventricular failure can be excluded, it may be assumed that mitral stenosis is present. Hemoptysis in such cases may help to distinguish between an Austin-Flint and an aortic regurgitation murmur, or in the diagnosis of mitral stenosis. At the time at which this study was completed, the authors point out that 33, or 66 per cent, of the 50 patients are dead; the average survival following the initial hemoptysis was thirty-two and a half months, varying from one day to more than five years. The average interval from the initial hemoptysis to the last follow-up examination of the 17 patients who are still living has been thirty-nine months and, to date, only 5 of these have survived five years or longer. Half of the patients with slight cardiac enlargement died within one or two days after hemoptysis, and two thirds died within a year. As these deaths were of patients in whom the prognosis was usually excellent, it is obvious that hemoptysis in such cases is a grave prognostic indication. Among the remaining patients the mortality was higher and the survival shorter than would have been expected of patients with cardiac enlargement and congestive failure alone. The mortality was higher among the patients with pulmonary infarction than in the series as a whole. Hemoptysis during pregnancy is not necessarily indicative of a bad prognosis, for the 2 pregnant women in the series survived the longest.

### American Journal of Surgery, New York 51:309-552 (Feb.) 1941

- Manchester Operation, with Special Reference to Its Development and Principles Involved in Its Technique. I. F. Frost, New York.—p. 311.
- Acute Surgical Complications of Fractures. H. L. Albright, Boston.—p. 320.
- Natural Adrenal Cortex Extract and Coagulation of Blood. F. R. Reed, Three Rivers, Mich.—p. 330.
- Treatment of Persistent Occipitoposterior Position by 180 Degree Manual Rotation of Occiput. S. S. Rosenfeld, New York.—p. 340.
- Ununited Fractures of Clavicle. R. K. Ghormley, J. R. Black and J. H. Cherry, Rochester, Minn.—p. 343.
- Preparation of Autogenous Bone Grafts with Osteotomes. W. G. Stuck, San Antonio, Texas.—p. 350.
- Use of Implantation Grafts in Healing of Infected Ulcers. K. M. Marks, Allentown, Pa.—p. 354.
- Surgical Removal of Hemangioma of Face. M. I. Berson, New York.—p. 362.
- Study of Role of Amino Acids in Clot Retraction: Effect of Methionine in Restoring Normal Clot Retraction and Control of Bleeding in Essential Thrombocytopenic Purpura. H. M. Rabinowitz, Brooklyn.—p. 366.
- Review of Malignant Melanoma of Mouth: Report of Case. H. Baxter, Montreal.—p. 379.
- Spontaneous Internal Biliary Fistula. E. L. Eliason and L. W. Stevens, Philadelphia.—p. 387.
- \*Staphylococcal Prostatitis Treated with Staphylococcus Toxoid. A. C. Drummond, New York.—p. 393.
- \*Healing of Tuberculous Nephrectomy Sinuses. M. E. Greenberger and I. Helfert, New York.—p. 396.
- The Ideal Dressing for Clean Wounds. O. Tenopir and F. M. Al Akyl, Brooklyn.—p. 399.

**Healing of Tuberculous Nephrectomy Sinuses.**—Greenberger and Helfert have used ozonized olive oil in the treatment of nonhealing incisions and sinuses following excision of a tuberculous kidney. They found that the oil stimulated healing and at the same time added to rather than detracted from the comfort of the patient. The technic consists of the daily instillation of a sufficient quantity of the ozonized olive oil to fill the sinuses completely. Since this preparation contains heat, carbons, significant quantities of nascent oxygen are released into the tissues of the sinus walls, where it acts as a bactericidal agent and a stimulant to local cellular metabolism. Thus sterilization of the wound and proliferation of tissue are promoted without destroying surrounding healthy tissue. Under this therapy the wounds have in most cases healed at a constant and satisfactory rate. The exposed surfaces of gaping lesions or sloughing. Of the 15 cases in which solution of triolein ozonide in olive oil was used the sinuses in 13 have healed completely in from two to five months. One wound which showed no evidence of healing during two months with other types of therapy healed readily under this treatment to such an extent that revision was easily done. In the fifteenth patient the wound was healing satisfactorily and only a single small sinus remained when the patient left the hospital without consent.

## Archives of Internal Medicine, Chicago

67:241-472 (Feb.) 1941

- \*Cardiac Lesions Associated with Chronic Infectious Arthritis. A. H. Baggenstoss and E. F. Rosenberg, Rochester, Minn.—p. 241.
- Familial Nonhemolytic Jaundice: Constitutional Hepatic Dysfunction with Indirect van den Bergh Reaction. W. Dameshek and K. Singer, Boston.—p. 259.
- Pneumococcal Pneumonia: Analysis of Records of 1,469 Patients Treated in the Los Angeles County Hospital from 1934 to 1938 Inclusive: III. Type-Specific Antipneumococcus Serum Therapy: Quantitative Relations Between Dosage and Results. F. J. Moore, R. E. Thomas, B. O. Raulston, A. Hoyt and J. D. Walters, Los Angeles.—p. 286.
- \*Studies on Old Age Pneumonia: II. Prophylactic Effect of Pneumococcus Polysaccharide Against Pneumonia. P. Kaufman, with technical assistance of A. Kaefely, C. O'Brien, C. Burnstein, S. K. Kling and W. Dmitruk, New York.—p. 304.
- Further Studies on Human Cardiac and Voluntary Muscle: Possible Implications of Changes in Creatine, Phosphorus and Potassium Content, with Special Reference to Heart Disease. G. H. Mangun, Charleston, S. C.; H. S. Reichle and V. C. Myers, Cleveland.—p. 320.
- \*Hemochromatosis: Report of Case. A. Cantarow and C. J. Bucher, Philadelphia.—p. 333.
- Estimation of Renal Function with Aid of Iodosecretory Index and New Ureosecretory Index: Improved Application of Creatinine Method for Determining Diuresis. J. T. Peters, New York.—p. 345.
- Experimental Study of Reciprocating Rhythm. D. Scherf, New York.—p. 372.
- Relation of Liver Function to Cirrhosis of Liver and to Alcoholism: Comparison of Results of Liver Function Tests with Degree of Organic Change in Cirrhosis of Liver, and with Results of Such Tests in Persons with Alcoholism Without Cirrhosis of Liver. H. B. Cates, Los Angeles.—p. 383.
- Fatal Bronchial Asthma: Report of Seven Cases. B. Craig Jr., New Haven, Conn.—p. 399.
- Diseases of Nutrition: Review of Certain Recent Contributions. H. R. Butt and W. V. Leary, Rochester, Minn.—p. 411.

**Cardiac Lesions Associated with Chronic Infectious Arthritis.**—At necropsy in 25 cases of chronic infectious (rheumatoid) arthritis Baggenstoss and Rosenberg demonstrated cardiac lesions in 20. Lesions identical with those of rheumatic fever were observed in 14 (56 per cent). Nonrheumatic cardiac lesions were present in 6 (24 per cent). In 10 of the 14 cases in which there were rheumatic lesions there was microscopic evidence that the inflammatory process was still active and progressive when death occurred. In 7 of these 14 instances the heart disease was judged to be an important factor in causing death. Also in only 7 of these 14 patients had signs or symptoms of heart disease been present during life. The high incidence of rheumatic cardiac lesions suggests a relationship between chronic infectious (rheumatoid) arthritis and rheumatic fever.

**Old Age Pneumonia and Effect of Pneumococcus Polysaccharide.**—Kaufman reports the work done with active immunization against pneumonia of inmates (more than 50 years of age) of the New York City Home with a capsular antigenic polysaccharide containing specific substance for type I and II pneumonia. During the winter of 1937-1938, 1,000 persons were immunized with 0.5 cc. of the polysaccharide containing 1 mg. of each active substance, and 1,120 persons were kept as controls. In 1938-1939 the same method was used except that 500 new patients were divided in such a way that every other one was inoculated with 0.5 cc. and alternates were kept as controls. Another thousand were taken from the old inmates and 500 were inoculated with 1 cc. containing 2 mg. of each active substance and 500 who had served as controls the previous year were again used as controls. In the first year there were 14 cases of pneumonia with 8 deaths among the 1,000 immunized persons. Among the 1,120 nonimmunized there were 63 cases of pneumonia with 47 deaths. The second year there were 9 cases of pneumonia with 5 deaths among the 750 immunized persons and 41 with 20 deaths among the 750 non-immunized. When the second year's study is subdivided it is found that there were 4 cases of pneumonia with 2 deaths among the 250 inmates receiving 0.5 cc. of polysaccharide with 1 mg. of each active substance and 5 cases with 3 deaths among the 500 given 1 cc. containing 2 mg. of each active substance. In the smaller control group there were 15 cases of pneumonia with 8 deaths and in the larger control group 26 cases with 12 deaths. Among the total 1,750 inoculated persons there were 23 cases of pneumonia with 13 deaths, making the morbidity rate 13.13 and the mortality rate 7.4 per thousand. Among the total 1,870 controls the figures are 104 cases with 67 deaths and the respective per thousand figures 55.66 and 35.8. The course of pneumonia in the immunized group (length of disease

and frequency of complications) was apparently not influenced by the inoculations. The prophylactic value seemed more pronounced in the first three quarters than in the last quarter of the year after immunization. The data show that the incidence and mortality rates of pneumonia were reduced not only for the types from which the active substances were isolated but also for other types. Further observation is necessary to corroborate the data. A group like the one used is particularly suited for immunizations against pneumonia, as among such a population the high incidence, mortality and case fatality rates and the frequency of repeated attacks make active immunization a practical problem. As postoperative pneumonia is a dreaded complication in this age group, immunization with polysaccharide may considerably reduce its incidence.

**Hemochromatosis.**—Cantarow and Bucher report a case of hemochromatosis because of the following atypical factors: 1. Glycosuria was absent and the dextrose tolerance was significantly decreased in spite of the unusual quantity of iron in the liver and pancreas. 2. Iron-containing pigment in the apparently characteristically pigmented skin was absent. 3. Cutaneous xanthomatosis with hypercholesterolemia was present but diabetes was absent. 4. Deficiency in adrenal cortical and androgenic hormones was demonstrated at postmortem study. 5. The unusual cause of death, acute pancreatic necrosis, was apparently unrelated to the hemochromatosis.

## Archives of Otolaryngology, Chicago

33:145-332 (Feb.) 1941

- Diagnosis and Treatment of Tuberculosis of Larynx and Contiguous Areas. G. E. Wilson, Saranac Lake, N. Y.—p. 145.
- Practical Points in Transcervical Radical Mastoidectomy. E. I. Matis, Kaimas, Lithuania.—p. 177.
- \*Prostigmine Methylsulfate in Treatment of Deafness and Tinnitus Aurium: Report of Fifty-Nine Cases with Negative Results. M. S. Etsner, I. A. Rush and D. Myers, Philadelphia.—p. 193.
- Surgical Correction of Collapsed Alar Cartilages: Report of Case. C. E. Gurney, Portland, Ore.—p. 199.
- Evaluation of Vertigo Following Head Injuries. S. Baumel and M. I. Marks, Cleveland.—p. 204.
- Thrombosis of Cavernous Sinus. E. Pace, Paducah, Ky.—p. 216.
- Tuberculosis of Middle Ear and Mastoid. M. C. Myerson, New York, and J. G. Gilbert, Brooklyn.—p. 231.
- Decubital Ulcers of Pharynx. R. Waldapfel, Grand Junction, Colo.—p. 251.
- Primary Osteoma of Frontal Sinus. R. W. Teed, Ann Arbor, Mich.—p. 255.
- Surgical Treatment of Bilateral Paralysis of Abductor Muscles. J. D. Kelly, New York.—p. 293.

**Prostigmine Methylsulfate for Deafness and Tinnitus Aurium.**—Etsner and his colleagues treated 59 cases of deafness and tinnitus aurium with prostigmine methylsulfate. Their results are contrary to those of their predecessors. The authors tested hearing with the audiometer and tuning forks. Tests were repeated twice a week. Four patients asserted that they had improved, but their audiometric readings disclosed no change. These patients said improvement continued even after administration of the drug was discontinued and physiologic solution of sodium chloride was substituted. Eighteen patients said that symptomatic improvement occurred soon after the first few injections, but here also improvement could not be verified by audiometer and tuning fork tests. After several weeks of treatment the euphoria and enthusiasm of the patients subsided, and the symptoms remained the same despite treatment. Eight patients after having received fifteen injections showed an 8 to 10 decibel improvement at varying times, but repeated hearing tests revealed that the improvement was neither permanent nor prolonged. Attacks of acute angina pectoris caused prostigmine therapy to be discontinued in 3 patients. The remaining 26 patients neither claimed nor showed any so-called improvement in the tinnitus aurium or hearing either during or after therapy.

## Archives of Physical Therapy, Chicago

22:65-128 (Feb.) 1941. Partial Index

- Climate and Weather in Relation to Physical Therapy. C. A. Mills, Cincinnati.—p. 69.
- Uses and Abuses of Audiometers. C. E. Kinney, Cleveland.—p. 94.
- Present Requirements for Acceptance of Hearing Aids as Determined by Council on Physical Therapy. H. A. Carter, Chicago.—p. 98.
- Artificial Fever versus Combined Fever-Chemotherapy in Gonococcal Infections. H. W. Kendall, D. L. Rose and W. M. Simpson, Dayton, Ohio.—p. 103.

## Bulletin of Johns Hopkins Hospital, Baltimore

68:119-202 (Feb.) 1941

- John Jacob Abel: A Portrait. P. D. Lamson, Nashville, Tenn.—p. 119.
- \*Factors Influencing Plasma Prothrombin in the Newborn Infant: IV. Effect of Antenatal Administration of Vitamin K on Incidence of Retinal Hemorrhage in the Newborn. A. E. Maumenee, L. M. Hellman and L. B. Shettles, Baltimore.—p. 158.
- Visceral Pain in Cases of Situs Inversus. A. B. King, Baltimore.—p. 169.
- Pollen Survey of the Islands of Bermuda. L. N. Gay, H. Curtis and T. Norris, Baltimore.—p. 179.
- \*Lowering of Blood Uric Acid by Uricase Injections. Ella H. Oppenheimer, Baltimore.—p. 190.

**Influence of Antepartum Vitamin K on Retinal Hemorrhage of the Newborn.**—Maumenee and his associates point out that, although a few cases of true hemorrhagic diathesis with definite deficiency in the prothrombin have been reported, there has been no direct correlation between the prothrombin level of the blood and the incidence of neonatal hemorrhage. Since September 1939 the authors have given alternate mothers entering for delivery with a viable baby 2 mg. of menadione or a unit-equivalent vitamin K active substance. Fifty mothers in the treated series received an additional 2 mg. of menadione by mouth daily for at least four days before delivery. For six months the eyegrounds of all infants, with the exception of very premature ones, were studied for retinal hemorrhage. A total of 446 babies was examined; 173 were born to mothers who had received vitamin K during labor, 50 to mothers who had received prolonged vitamin K therapy and the remaining 223 to women who were not treated with vitamin K. In 26 infants with retinal hemorrhage, born of untreated mothers, the average plasma prothrombin level was 16.7 dilution units as against the average infant plasma prothrombin level of 28 dilution units. Babies with retinal hemorrhage then tend to show a diminished prothrombin level, but no direct correlation between the extent of the retinal hemorrhage and the degree of the hypoprothrombinemia could be demonstrated. The plasma prothrombin level of infants born to mothers receiving vitamin K was usually elevated. However, 21 such infants who had retinal hemorrhage showed an average prothrombin of 31 dilution units. Failure to promote a rise would seem to indicate either an extremely low prothrombin value before therapy, a resistance to intrapartum therapy or retinal hemorrhage early in labor; that is, before antepartum treatment. The latter is supported by hemorrhage in babies born by cesarean section performed during the early stages of labor. As the prothrombin levels of infants with hemorrhage born of untreated mothers are lower than in normal infants a reasonable explanation of retinal hemorrhage in this treated group would be one or a combination of the three foregoing factors. As intrapartum vitamin K may not provide complete prophylaxis against hypoprothrombinemia, 14 infants without retinal hemorrhage, whose mothers received vitamin K during labor, were picked at random for a control series. The average prothrombin levels of these infants were 44.6 dilution units. Only 2 of the infants of the 50 mothers who at term were given 2 mg. of menadione for at least four days and then labor was induced by artificial rupture of the membranes were found to have hemorrhages. Their prothrombin levels were 36.5 and 4.4 dilution units, respectively. The most probable explanation for this failure was a refractoriness of either the mother or the infant to vitamin K. The average level of 29 of the infants whose mothers were treated for at least four days was 56.1 units. Prothrombin studies done on mother and infant show that failure to respond to treatment with a vitamin K preparation was due to deficient absorption. Normal gallbladder studies indicated that this failure was not due to any abnormality of the biliary tract. Future studies may show whether or not this will be the explanation for all refractory cases.

**Lowering of Blood Uric Acid by Uricase Injections.**—Oppenheimer records the fact that a solution containing uricase if injected intravenously or intramuscularly into hens with a "gouty" or high plasma uric acid concentration will lower the uric acid level. The higher the plasma uric acid level, the greater the uricolytic activity of the enzyme. One determination of the duration of the uricolytic activity of a single uricase injection indicates that it lasts at least twenty-four hours. Two hens receiving weekly uricase injections for four and five weeks,

respectively, showed a decidedly lower average uric acid level than control hens on the same meat diet. Determinations over longer periods are needed to establish the validity of the observation. The work has not been in progress long enough to determine whether the relatively small dosage of uricase employed will prevent the appearance of tophi.

## Journal of Immunology, Baltimore

40:73-242 (Feb.) 1941. Partial Index

- Anticoagulants and Complementary Activity: Experimental Study. E. E. Ecker and L. Pillemer, Cleveland.—p. 73.
- Studies Concerning Possible Mechanisms Involved in Experimental Serum Sickness. L. R. Jones and E. C. Roberts, St. Louis.—p. 107.
- Experimental Diphtheria in Albino Rat. E. Seligmann and C. W. Jungblut, New York.—p. 119.
- Studies on Mechanism of Arthus Phenomenon. P. R. Cannon and C. E. Marshall, Chicago.—p. 127.
- Neutralization of Virus of Myxoma by Specific Immune Serum. R. F. Parker and L. H. Bronson, Cleveland.—p. 147.
- Blood Groups of Papago Indians. E. L. Brezcale, R. A. Greene, Tucson, Ariz., and L. J. Kantor, Sells, Ariz.—p. 161.
- Studies with Colored Antigens: I. Rate of Disappearance of Dye Albumin from Blood. H. N. Pratt and M. I. Gregersen, Boston.—p. 163.
- Electrophoretic Analysis of Tetanal Antitoxic Horse Serums. J. van der Scheer, R. W. G. Wyckoff and F. H. Clarke, Pearl River, N. Y.—p. 173.
- Active Immunization of Mice with Hemolytic Streptococci. J.-P. Wu, Peiping, China.—p. 179.
- Staphylococcus Toxoid Prepared by Peptic Digestion. I. A. Parfentjev, Frances L. Clapp and A. Waldschmidt, Pearl River, N. Y.—p. 189.
- Passive Immunization of Mice Against Human Influenza Virus by Intranasal Route. W. Henle, J. Stokes Jr. and Dorothy R. Shaw, Philadelphia.—p. 201.

## Journal of Infectious Diseases, Chicago

68:1-96 (Jan.-Feb.) 1941. Partial Index

- Studies on Virus of Psittacosis Cultivated in Vitro. H. Y. Yamamura and K. F. Meyer, San Francisco.—p. 1.
- Therapeutic Properties of Sulfanilamide and Related Drugs in Experimental Typhoid Infection of Mice. R. T. Fisk, Los Angeles.—p. 20.
- Laboratory Infections Due to Brucella. K. F. Meyer and B. Eddie, San Francisco.—p. 24.
- Multiple Pneumococcal Infections in Pneumonia. Sarah L. Cockrell and J. M. Rueggesser, Cincinnati.—p. 33.
- Olfactory Mucosa as Possible Source of Antipoliomyelitic Substances. R. H. Allen and P. F. Clark, Madison, Wis.—p. 53.
- Intracerebral Infection of Mice with Haemophilus Influenzae as Index of Strain Virulence and Protective Value of Immune Serum. Mercedes Vicente de Torregrosa and T. Francis Jr., New York.—p. 59.
- Propagation of Virus of Lymphogranuloma Venereum on Chorioallantois of Developing Egg. M. E. Howard and Winifred S. Hull, New Haven, Conn.—p. 73.
- Influenza Virus Studies During 1939 Epidemic in Central Europe. R. M. Taylor and M. Dreguss, Budapest, Hungary.—p. 79.
- Certain Broad Epidemiologic Aspects of Influenza. R. M. Taylor, A. Petrilla and M. Dreguss, Budapest, Hungary.—p. 90.

## Journal-Lancet, Minneapolis

61:35-68 (Feb.) 1941

- Remote Vascular Lesions of Toxemias of Pregnancy and Their Clinical Significance. J. L. McKelvey, Minneapolis.—p. 35.
- Appendicitis and Its Treatment. B. H. Brunkow, Billings, Mont.—p. 39.
- Sterility Investigation: Plan for Study and Treatment. G. W. Hunter, Fargo, N. D.—p. 41.
- Hypertension from the Standpoint of the Otolaryngologist. W. E. Camp, Minneapolis.—p. 45.
- Thrombosis of Axillary Vein Following Effort: Case Report. R. N. Allin, Madison, Wis.—p. 47.
- Cold Vaccine Study. L. L. Stanley, San Quentin, Calif.—p. 48.
- Care of Acute Sinus. F. H. Roost, Sioux City, Iowa.—p. 49.
- Recent Advances in Intravenous Fluid Therapy. J. H. Tillisch, Rochester, Minn.—p. 51.
- \*Use of Bacteriophage in Treatment of Furunculosis in Students. W. W. Dalitsch, Chicago.—p. 56.

**Bacteriophage for Furunculosis.**—Dalitsch states that furunculosis in students of the professional schools of the University of Illinois has been most prevalent in the spring. He believes that the treatment of furunculosis is incomplete without a wider use of bacteriophage. Friction of clothing along the collar line, sleeves and buttocks seems to favor inoculation of the skin. Trauma (picking the nose, plucking hair and squeezing of comedones) may initiate the lesion. Well nourished and obese persons are slightly more prone to this affliction. When the furuncle was in an early stage and the inflammation still diffuse with no opening into the lesion, hot water fomentations were applied continuously until pointing had occurred. The fomentations were covered with parchment



paper and held in place with adhesive tape. They were changed about every hour or two. When the lesion had sufficiently localized, the center of it was usually covered with a thin skin, and the lesion was opened by merely lifting off the desquamated tissue. A small wick drain, consisting of a few threads of plain gauze, was carefully passed into the sinus leading into the lesion and continuous wet dressings saturated with bacteriophage were applied. The bacteriophage dressing was covered with parchment paper and held in place with adhesive tape, with its upper margin left open. Bacteriophage was dropped on the dressing through the open upper edge in sufficient amount and often enough to keep it moist. In the case of intranasal infections a loose cotton dressing soaked with the bacteriophage was inserted into the nasal passage so as to be in contact with the infected area. At intervals additional bacteriophage was added with a medicine dropper to keep the dressing saturated. The technic is based on direct contact of the bacteriophage with the infected tissues. Plain gauze and cotton dressings were used because antiseptics hinder the action of bacteriophage. The students missed no time from classes. In a series of more than 200 cases encountered over five years the results were uniformly gratifying. Pain was relieved soon after the bacteriophage was applied. In from six to twelve hours the site of the lesion appeared much smaller, and tension and tenderness were greatly diminished. Thick purulent exudate was changed into a clearer serous drainage. Healthy granulations were soon evident. Movement of the affected part was possible, and dressings were changed without pain. The course of the infection was shortened and convalescence rapid. The method is particularly applicable to intranasal and facial infection. Every practitioner is familiar with examples of fatal complications resulting from these lesions. Intranasal furuncles present a type of infection that is always looked on with trepidation and helplessness because little active treatment can be used and because manipulation and instrumentation are contraindicated. The bacteriophage method gives a more effective active therapy from which prompt improvement can be expected with a high degree of confidence. "Crops" of satellite boils do not recur.

### Journal of Pediatrics, St. Louis

18:145-288 (Feb.) 1941

- Treatment of Pneumonia in Infants and Children. B. W. Carey, Detroit.—p. 153.
- Sulfapyridine Resistance of Pneumococci Following Sulfapyridine Therapy in Infants and Children and Comparative Potency of Three Chemotherapeutic Agents for Pneumococci as Shown by Laboratory Tests. W. J. Anger, Toronto, Canada.—p. 162.
- Dark Adaptation and Vitamin A: Further Studies with Biophotometer. P. C. Jeans, Evelyn L. Blanchard and F. E. Satterthwaite, Iowa City.—p. 170.
- Comparison of Two Methods of Measuring Dark Adaptation. R. E. Eckardt and L. V. Johnson, Cleveland.—p. 195.
- Absorption of Vitamin A in Celiac Disease: Interpretation of Vitamin A Absorption Test. C. D. May and J. F. McCreary, Boston.—p. 200.
- Report of Clinical Experience with Meningococcal Meningitis. J. H. McLeod, Washington, D. C.—p. 210.
- Menigeal Meningitis: Role of Laboratory in Therapy. Sara E. Hill, N. C.—p. 217.
- (Hemorrhagic Disease) of Newborn Infant 3 Months of Age. P. H. Urham, N. C., and L. R. B. Glesne, Cincinnati.—p. 235.
- Gangrene as Complication of Scarlet Fever: Report of Case with Paratyphoid. A. L. Hoynes and L. Smollar, Chicago.—p. 242.
- Postvaccinal Neuritis: Report of Case. R. H. Young and C. Moore, Omaha.—p. 248.
- Tongue-Tie in Infants and Children. E. T. McEnery and Frances Perowski Gaines, Chicago.—p. 252.

**Treatment of Neonatal Hypoprothrombinemia.**—Lawson reviews the literature on the treatment of hypoprothrombinemia (hemorrhagic disease) of the newborn infant. He describes a microprothrombin test which makes repeated tests on infants safe and simple. The test is performed at the infant's bedside in a room with a temperature of not more than 80 F., by placing 20 cu. mm. of thromboplastin suspension in the well of a common, hollow-ground slide, using a 20 cu. mm. Sahli hemoglobin pipet. The infant's heel is washed with alcohol, dried and punctured with a sharp lancet so that the blood flows freely. Twenty cu. mm. of blood is drawn into a clean pipet, added to the thromboplastin and mixed with it for from five to ten seconds with a fine glass stirring rod. By tilting the

slide, the mixture flows back and forth until a sharp end point occurs when it clots. The time is measured with a stop watch from the addition of the blood to the time of clotting and is expressed as the "microprothrombin time." The test can be performed repeatedly without danger to the infant. The author's studies show that the antepartum administration of menadione is effective in preventing hypoprothrombinemia of the newborn infant. It may prove desirable to give this drug or a similar naphthoquinone daily to mothers during the last month of pregnancy. If this has not been done, oral administration after labor has begun is effective if as much as 4 mg. is given at least five hours before delivery. Unless a decided degree of hypoprothrombinemia exists at birth, the intramuscular injection of 1 mg. of menadione in sesame oil during the first twelve hours of life will prevent any subsequent hypoprothrombinemia. Bile salts are not necessary for absorption in the newborn infant without biliary obstruction. Intramuscular blood transfusion is not effective prophylactically or therapeutically. The author considers a microprothrombin time of 75 seconds or longer as indicating a serious prothrombin deficiency.

**Histoplasmosis.**—Rhodes and his associates cite the occurrence of histoplasmosis in an infant of 3 months, evidently the youngest on record of the 5 cases reported. A culture of *Histoplasma capsulatum* was obtained from the infant's blood stream twenty-four hours before death. The incidence of the disease has risen sharply in the past two years. It should no longer be considered a rarity and must be ruled out whenever a leukopenia, prolonged fever, splenomegaly, anemia of doubtful etiology or chronic infection of the respiratory tract is present. The symptomatology can vary, but a diagnosis may still be made by finding the small, oval, encapsulated organisms (from 1 to 3 microns) in the mononuclear cells in peripheral blood smears, sternal bone marrow smears, discharge from otitis media, sections of spleen removed at splenectomy and biopsy sections of skin and lymph nodes. The fungus, which is characterized by large warty, thick walled chlamydospores attached to the fungus filaments, is moldlike. No specific therapy has had sufficient trial because diagnoses, except for 3 cases, have not been made until necropsy. Further trial of antimony preparations—antimony and potassium tartrate and trivalent and pentavalent organic preparations of antimony—is advised.

### Michigan State Medical Society Journal, Muskegon

40:81-160 (Feb.) 1941

- Coronary Vascular Heart Disease. J. H. Musser, New Orleans.—p. 99.
- Unusual Hypertension: Case of Ten Years' Duration. H. Stalker, Detroit.—p. 105.
- Undescended Testis. L. J. Bailey, Detroit.—p. 107.
- Congenital Umbilical Hernia with Eversion. H. M. Nelson and T. S. Fandrich, Ann Arbor.—p. 111.
- Feminine Psychology, with Emphasis on Gynecologic and Obstetric Phases. L. A. Schwartz, Detroit.—p. 113.

### New England Journal of Medicine, Boston

224:221-264 (Feb. 6) 1941

- Sulfanilamide and Its Derivatives: Sulfanilamide in Management of Acute Streptococcal, Particularly Scarlatinal, Infections of Upper Respiratory Tract. C. Wesselhoef, Boston.—p. 221.
- Id.: Treatment of Puerperal Sepsis. J. P. Cohen, Boston.—p. 226.
- Id.: Treatment of Urinary Tract Infections by Specific Therapy: Clinical Discussion. E. G. Crabtree, Boston.—p. 229.
- Id.: Treatment of Meningococcal Meningitis. E. H. Place, Boston.—p. 234.
- Id.: Skin Manifestations Due to Sulfanilamide and Its Derivatives. A. M. Greenwood, Boston.—p. 237.
- Criminal Aspects of Faith Healing. I. H. Rubenstein, Chicago.—p. 239.
- Uncommon Infectious Diseases in New England. C. S. Keefer, Boston.—p. 242.

224:265-306 (Feb. 13) 1941

- \*Studies on Hemoglobin Regeneration in Patients with Vitamin C Deficiency. E. L. Lozner, Boston.—p. 265.
- \*Sulfanilamide in Treatment of Acute Pelvic Inflammatory Disease. J. T. Williams, Boston.—p. 269.
- Spinal Anesthesia in Obstetrics, Using Pontocaine-Glucose Solution. J. C. Shull and E. P. Manning, Boston.—p. 271.
- \*Diabetes Mellitus and Pregnancy. M. Nothmann, Boston.—p. 275.
- Physiologic and Therapeutic Effects of Hypothermia. J. H. Talbott, Boston.—p. 281.

**Hemoglobin Regeneration in Vitamin C Deficiency.**—Lozner reports observations concerning hemoglobin regeneration in 5 patients with presumptive vitamin C deficiency (shown by complete chemical absence of reduced ascorbic acid from the



blood plasma) and moderate or mild anemia. The patients were treated with bed rest and a diet limited to whites of eggs, white bread, white soda crackers, butter, spaghetti, rice, bacon, corn syrup, tea, coffee and milk boiled for five minutes. Three of the patients presented the clinical picture of scurvy, 1 of pellagra and 1 of idiopathic hypochromic anemia. Four of the 5 patients showed satisfactory hemoglobin regeneration without vitamin C administration, even though on a diet containing only traces of vitamin C and vitamin B complex. In 3 of these 4 patients, the administration of ascorbic acid, after the initial hemoglobin regeneration, neither caused reticulocytosis nor increased the speed of hemoglobin increase. The remaining patient had clinical scurvy with melena and anemia. During the control period neither the melena nor the anemia disappeared. Coincident with vitamin C therapy the melena ceased, and reticulocytosis and hemoglobin regeneration ensued. Complete regeneration of hemoglobin of 2 patients did not occur until they were placed on yeast and a general diet.

**Sulfanilamide for Acute Pelvic Inflammation.**—Williams used sulfanilamide for the treatment of 72 patients who had acute pelvic inflammation. He compares the results with those obtained in 100 similar patients treated during the pre-sulfanilamide era by route bed rest, fluids, catharsis, ice or heat to the abdomen and hot vaginal douches. The patients given sulfanilamide received in all other ways the same treatment as the control series. There were no fatalities in either series. In the control series the temperature of 72 per cent of the patients fell to normal within one week after admission. Improvement of pain, tenderness and leukocytosis almost paralleled the fall in temperature. The average duration of the febrile reaction in the control series was six and seven-tenths days. The longest elevation of temperature elevation was thirty-five days. In 63 patients suffering from their first attack the average was seven and nine-tenths days; in 37 patients with recurrent attacks it was four and eight-tenths days. Seventy-two per cent of the sulfanilamide-treated patients also showed a normal temperature within one week. The average time for a normal temperature to appear was five and eight-tenths days. In primary attacks (44 patients) the temperature elevation averaged six days, whereas in recurrent attacks (28 patients) the average was five and seven-tenths days. The longest elevation of temperature was thirty-six days. This patient ultimately recovered after a pelvic abscess developed and broke through into the rectum just as she was being prepared for colpotomy. A pelvic abscess formed in another patient while she was under sulfanilamide treatment. It was drained by colpotomy on the seventh day after admission; the temperature fell to normal two days later. These 2 cases are regarded as absolute failures of sulfanilamide therapy. Of the control patients 13 per cent and of those treated with sulfanilamide 11 per cent were deemed to require salpingectomy. The dramatic results often obtained with sulfanilamide in streptococcal infections and with sulfanilamide and sulfapyridine in pneumonias were disappointingly absent.

**Diabetes Mellitus and Pregnancy.**—Nothmann states that 5 diabetic women with a past history of several abortions and stillbirths were successfully delivered by prophylactic cesarean section. The influence that pregnancy will have on the diabetes of the mother cannot be predicted in spite of careful treatment. Repeated pregnancies in the same patient may take different courses. The author describes a state of hypoglycemia in infants of diabetic mothers during the first days of life which is sometimes accompanied by periods of unconsciousness. Its cause is the hypertrophy and overfunctioning of the pancreas. The cholesterol level of the 5 newborn babies ranged from 58 to 74 mg. per hundred cubic centimeters. Only 1 baby had a value of 162 mg. An icterus neonatorum later developed in this infant. The children developed well and continued to be healthy. Considering the extremely high mortality rate that exists among the fetuses and children of diabetic women, prophylactic cesarean section is recommended to save the life of the fetus, whose life is in greater danger than the mother's.

## New York State Journal of Medicine, New York

41:307-418 (Feb. 15) 1941

- Arsenic as Possible Cause of Subacute Encephalomyelitis: Correlation of Chemical, Clinical and Histologic Observations. A. D. Ecker, Syracuse.—p. 335.
- Nerve Pathways and Clinical Features of Shoulder Pain in Relation to Angina Pectoris. H. R. Miller, New York.—p. 345.
- Some Problems Involved in the Fitting of Hearing Aids. T. H. Halsted and F. M. Grossman, New York.—p. 352.
- \*Periodontia in Internal Medicine: Periodontal Disease, Its Importance as Focus of Infection and Possibilities of Treatment. S. C. Miller and A. N. Arvins, New York.—p. 359.
- Organization of an Arthritis Clinic, with Special Reference to the Arthritis Clinic at the Hospital for the Ruptured and Crippled, New York City. R. G. Snyder and C. Traeger, New York.—p. 365.
- \*Roentgen Ray Therapy of Plantar Warts. A. H. Montgomery and R. M. Montgomery, New York.—p. 371.
- Early Recognition of Serious Lesions of Nose, Throat and Ear. G. M. Costes, Philadelphia.—p. 376.
- Clinical Experiences with Stilbestrol. A. R. Abarbanel and M. D. Klein, New York.—p. 383.

**Periodontia in Internal Medicine.**—Miller and Arvins believe that the danger of internal infection from periodontal foci (pus pockets, gingivitis and the like) is much more potent than that from periapical disease. They list the following reasons: 1. A much greater zone is involved than in a periapical abscess, considering the total surface area of the walls of all pockets. At least twenty times the absorption surface is involved in an average case of periodontal disease as in a well developed chronic periapical abscess. 2. Absorption from the gingival crevice is more rapid, as the blood and lymph supply to the gingiva is much greater than to a periapical area in bone, especially when the latter is surrounded by even a slight degree of condensation. Round, Kirkpatrick and Hails have shown that the force of mastication is sufficient to pump bacteria and their toxins into the circulation. 3. Resistance to bacterial growth is lower in the gingival crevice than anywhere else in the oral cavity because of stagnation and food accumulation. The depths of gingival crevices and periodontal pockets offer an ideal incubation zone for strains of streptococci which grow best in a low oxygen environment. Therefore the authors point out that not only should any comprehensive search for foci of infection include roentgen evidence of lesions at the apexes of teeth but the study should encompass the alveolar margin for activity of bone destruction and a thorough clinical examination for gingival disturbances which have not as yet affected the bony structure. The amount of bone loss is not as significant as the type of bone which remains, for this determines the activity of periodontal disease. Periodontal disease is primarily dysfunctional in origin, and the disturbing factors producing a "locus minoris resistentiae" may be broadly grouped as functional, traumatic and systemic (endocrine, allergic and nervous). The primary therapeutic procedure is the restoration of functional coordination of the teeth so that stress is evenly divided and there is no strain in any excessive movements. In young persons orthodontia may be beneficial, in adults it should always be followed by the shaping of the teeth to conform to the patient's age and functional requirements. Dietary deficiencies or systemic diseases which may be causing or complicating the local disease must be attended to. The direct local requirement of a fibrous, detergent diet is of equal importance to the mineral, vitamin and other dietary requirements for oral health. Pus pockets must be eliminated by surgical gingivectomy, conservative surgery or conservative subgingival curettage. The etiologic factors of periodontal disease are rarely, if ever, single. Periodontal disease can be cured, and the resulting improved health can be maintained.

**Irradiation for Plantar Warts.**—The Montgomerys report the results of treating 583 patients with plantar warts exclusively by means of roentgen rays. Of the 487 patients whose end results are known, 439 or 90.35 per cent were cured. Mosaic warts with ill defined edges, which they have found radioresistant or unsuitable for close shielding, were not included. Otherwise the cases were unselected. Most of the warts had resisted other forms of treatment or they were recurrences. Many were fibrosed and their average duration was eleven months. A radical modification of the usual technic was employed. It consisted of a large predetermined initial

dosage, its size depending on several factors (size, depth, callus, keratitis and fibrosis), followed at intervals of ten days by one, two or three saturation doses of four fifths that of the initial dose, through precisely fitting shield holes in lead sheeting. These holes are reduced in size as the lesion shrinks. There were no reactions, pain, loss of time from work or any other unfortunate sequelae. Seldom have the authors irradiated a wart previously treated by others with radium or roentgen rays, for even if the total dosage given is known the size of the aperture through which the irradiations had been given is seldom definite.

### North Carolina Medical Journal, Winston-Salem

2:59-108 (Feb.) 1941

- Sulfathiazole in Treatment of Severe Staphylococcal Infection. W. B. Martin and R. B. Grinnan Jr., Norfolk, Va.—p. 59.  
The Art of Pediatrics. S. F. Ravenel, Greensboro.—p. 63.  
The Science of Pediatrics. D. L. Smith Sr., Saluda.—p. 65.  
Pediatric Economics. B. W. Roberts, Durham.—p. 67.  
The Aims of the American Academy of Pediatrics. A. H. London Jr., Durham.—p. 71.  
Mortality with Causes of Death in Series of 917 Consecutive Hysterectomies. E. S. Boice, Rocky Mount.—p. 72.  
Pneumococcosis. H. F. Eason, Sanatorium.—p. 79.  
Prolonged Occlusion in Latent Phoritis. F. O. Fay, Norfolk, Va.—p. 83.  
Full Term Intra-Abdominal Pregnancy: Report of Case. R. A. White, Asheville.—p. 87.

### Radiology, Syracuse, N. Y.

36:131-260 (Feb.) 1941. Partial Index

- Oral Cholecystography: Basis of Standardization of Method. W. W. Robinson, Memphis, Tenn.—p. 131.  
Craniolacemia (Lückenschädel): Report of Fifty-Four Cases. E. C. Vogt and G. M. Wyatt, Boston.—p. 147.  
Importance of Accurate Collimation of Beam in Deep Roentgen Therapy: Effect of Size of Focal Area and Position of Limiting Diaphragm, with Special Reference to Supravoltage. E. Schons, St. Paul.—p. 154.  
Roentgen Localization of Myocardial Damage Resulting from Coronary Artery Disease. G. Levene and R. M. Lowman, Boston.—p. 159.  
Aneurysm of Splenic Artery. J. V. Seids and H. Hauser, Cleveland.—p. 171.  
Systemic Care of Patients Undergoing Radiation Therapy. J. D. Peake, Mobile, Ala.—p. 181.  
Induction by Roentgen Rays of Hereditary Changes in Mice. G. D. Snell, Bar Harbor, Maine.—p. 189.  
Roentgen Diagnosis of Neoplasms of Air and Food Passages, with Particular Reference to Larynx. E. P. Pendergrass and B. R. Young, Philadelphia.—p. 197.  
The Copying of Roentgenograms. G. M. Busanovich, Philadelphia.—p. 212.  
\*Peptic Ulcer: Review of 1,033 Cases and Follow-Up Study of Patients Diagnosed Between Ten and Twenty Years Ago. M. F. Dwyer, J. M. Blackford, W. S. Cole and R. H. Williams, Seattle.—p. 217.  
Slight Enlargement of Head of Pancreas: Associated Pathologic Changes in Duodenum: Report of Seven Cases. M. Feldman, Baltimore.—p. 224.

**Peptic Ulcer.**—Dwyer and his associates review the 930 cases of duodenal ulcer and 103 cases of gastric ulcer encountered in a private clinic up to January 1939. In order to determine the progress of the patients with duodenal ulcer they sent out questionnaires to 238 patients who had been treated medically and surgically for ulcer from ten to twenty years before. Responses were received from 141 patients, 77 of whom had received medical and 64 surgical treatment. The average time since treatment had been fourteen years. Tabulation of the results for the 77 patients who had received medical treatment showed that 65 per cent considered themselves as having obtained 75 per cent or more relief of their gastric symptoms. Approximately one third (35 per cent) of the medically treated patients stated that they had obtained only 50 per cent or less relief of their symptoms and one half (56 per cent) of the patients with unsatisfactory results were later operated on. Pyloric obstruction developed in 6 per cent of the medically treated patients in an average of ten years. Of the 64 patients treated surgically, 86 per cent considered that they had received 75 per cent or more relief from their symptoms after operation. Posterior gastroenterostomy was done on 52 of these patients, and satisfactory results were obtained in 90 per cent; pyloric obstruction was the indication for operation in only 6 patients. The ulcer was excised in the remaining 12 patients and, after ten years, only one third considered the operation a success. Hemorrhage was recorded in 208, or 19 per cent of the entire series. Active hemorrhage

caused 113 of these patients to seek relief. Massive hemorrhage is more frequent before 45 years of age, but vital statistics show that only 4 per cent of patients dying of massive hemorrhage from peptic ulcer are less than 45 years of age. Early emergency operations for massive hemorrhage from ulcer in patients more than 45 years of age should save many lives. The highest incidence of duodenal ulcer is between 21 and 30 years of age; one third of the authors' patients began to have dyspepsia during this decade. The younger the patient at the onset of duodenal ulcer, the more characteristic are the symptoms. Patients less than 30 years of age who present gastric symptoms suggestive of peptic ulcer are more apt to have an ulcer than are older patients, especially those more than 40 years of age. The causes of reflex manifestations are considerably less frequent in younger patients than among older ones. Careful roentgen examination is the most important factor in diagnosing or excluding duodenal ulcer. Gastric ulcer is found in relatively older persons. The symptomatology of gastric ulcer often presents atypical and irregular disturbances, and these tend to be more severe than those associated with duodenal ulcer.

### Southwestern Medicine, El Paso, Texas

25:35-66 (Feb.) 1941

- Lung Tumors. C. W. Maynard, Pueblo, Colo.—p. 35.  
Treatment of Generalized Peritonitis. D. C. Collins, Los Angeles.—p. 39.  
Infections of Head and Neck. G. L. Pattee, Denver.—p. 41.  
Recent Advances in Surgery. E. P. Palmer, Phoenix, Ariz.—p. 43.  
Incidence of Syphilis Among College Students. R. A. Greene, E. L. Breazale and J. E. Andes, Tucson, Ariz.—p. 46.

### Surgery, St. Louis

9:163-330 (Feb.) 1941

- Jejunostomy for Relief of Malfunctioning Gastroenterostomy Stoma. A. W. Allen and C. E. Welch, Boston.—p. 163.  
Section of Spinothalamic Tract in Medulla with Observations on Pathway for Pain. H. G. Schwartz and J. L. O'Leary, St. Louis.—p. 183.  
Wound Healing, with Especial Reference to Muscle and Fascia Repair. K. S. Chonka, Philadelphia, and R. W. Whitehead, Denver.—p. 194.  
\*Management of Postoperative Wound Separation. L. S. Fallis, Detroit.—p. 198.  
\*Postoperative Shock Due to Hemolytic Streptococcus Wound Infection. J. D. Stewart, Boston.—p. 204.  
Oral and Parenteral Use of Synthetic Vitamin K Active Substances in Hypoprothrombinemia. J. D. Stewart, Boston.—p. 212.  
Relative Merits of Scalpel and High Frequency Current in Nephrotomy: Experimental Study. C. C. Higgins and M. Glazier, Cleveland.—p. 220.

**Management of Postoperative Wound Separation.**—Fallis suggests that conservative nonoperative treatment be more widely adopted for treating disrupted abdominal wounds. A review of all the cases of such wounds at the Henry Ford Hospital up to and including the year 1935 gives the mortality rate of 34 per cent; 70 per cent of the patients who died did so within twenty-four hours of being subjected to secondary closure. It seems that at least in certain cases the operation itself was a determining lethal factor. Therefore alternative methods of management should receive serious consideration. Since 1936, 27 cases of wound disruption have been treated; they occurred among 4,153 laparotomies. The mortality rate was 37.3 per cent; but what is significant is the evidence in favor of nonoperative treatment. Seven of the 16 patients whose wounds were resutured died, a mortality of 43 per cent, but only 3 of the 11 whose wounds were strapped with adhesive tape died, a mortality of 27.3 per cent. Henceforth the author states that secondary suture has gradually been abandoned until, in the last two years, all disrupted wounds occurring in the general surgical service of the Henry Ford Hospital have been treated by packing and adhesive strapping, with excellent results.

**Postoperative Shock Due to Hemolytic Streptococcus Wound Infection.**—Stewart reports 4 cases which illustrate the syndrome of postoperative shock due to fulminating infection of the operative field with hemolytic streptococci. There was a delay of more than twenty-four hours after the onset of shock before wound infection was suspected. Immediate recognition is urgent, so that specific chemotherapy and immunotransfusion may be initiated early.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

**British Journal of Dermatology and Syphilis, London**  
53:33-64 (Feb.) 1941

- \*Effects of Sulfonamide Compounds on Lupus Erythematosus. H. W. Barber.—p. 33.  
Physical Properties of Ointment Bases. P. B. Mumford and R. M. Mumford.—p. 45.  
The Carrot as a Cause of Dermatitis. H. R. Vickers.—p. 52.

**Sulfonamide Compounds and Lupus Erythematosus.**—Barber suggests that lupus erythematosus may be of either tuberculous or streptococcic origin. When of the latter origin, sulfonamides (usually sulfanilamide) destroy the streptococci in the various foci and liberate toxin which provokes a complex reaction consisting of a rise of temperature, usually preceded by a rigor of varying intensity, generalized or localized pains in the fibromuscular tissues, a widespread scarlatiniform erythema, a focal reaction in existing patches of the eruption, reactivation of healed patches, appearance of new erythematous lesions continuous with or distinct from areas already affected, and painful swelling of lymph nodes. When the reaction has subsided, the eruption improves or disappears because of the diminished absorption of toxin or antigen. Although subsequent administration of the drug may be followed by an immediate and severe reaction, possibly owing to the remaining organisms being more vulnerable or accessible to it, the reactions tend progressively to diminish as the organisms are gradually destroyed. When a tuberculous infection was apparently responsible, the reactions did not occur nor was the eruption affected. The author believes that the reactions are due to the liberation of streptococcus toxin by the action of the sulfonamides on latent foci of infection and are not instances of drug fever.

**British Journal of Ophthalmology, London**  
25:49-96 (Feb.) 1941

- Chi Square Test of Significance Applied to Series of Intracapsular Cataract Extractions. W. J. B. Riddell.—p. 49.  
\*Experimental Pigmentary Degeneration of Retina by Sodium Iodate. A. Sorsby.—p. 58.  
Nature of Experimental Degeneration of Retina. A. Sorsby.—p. 62.  
Convergence. Margaret Dobson.—p. 66.  
Third Brazilian Congress in Ophthalmology, July 1939. E. E. Cass.—p. 71.

**Experimental Pigmentary Degeneration of Retina by Sodium Iodate.**—Sorsby reviews clinical cases in which the use of septojod (a German iodine preparation containing sodium hypoiodite and sodium hypoiodate) led to transient or permanent loss of vision from pigmentary retinal changes. The author's experimental work and that of others leading to the incrimination of sodium iodate as the toxic agent is presented. The dosage for the experimental production of pigmentary degeneration of the retina in the rabbit is 5 cc. of 2 per cent solution injected intravenously. There is no evidence that with this dosage there is any permanent damage to other tissues, so that sodium iodate may be regarded as a selective poison for the retina. Vital staining (with Kiton fast green) has shown that the retina is damaged by iodate in the albino rabbit though no pigmentary disturbances are seen with the ophthalmoscope. Septojod has been used widely in German-speaking countries for septic conditions on the assumption that nascent iodine is liberated in the presence of septic material. It has been especially popular in the treatment of puerperal sepsis.

**British Journal of Radiology, London**  
14:79-114 (March) 1941

- Cysticercus Cellulosa: Its Radiographic Detection in the Musculature and Central Nervous System. J. F. Brailsford.—p. 79.  
Radiologic Investigation of Dyspeptic Soldiers. R. Saffley.—p. 96.  
Comparison of Effects of Neutron and Gamma Ray Ionization on Electrophoretic Mobility of Colloidal Graphite Particles. L. H. Gray, J. Read and H. Liehmann.—p. 102.  
Combination of Cholecystography and Barium Meal Examination: Economical and Practical Value. A. S. Johnstone.—p. 107.  
X-Ray Skin Reactions and Protective Role of Normal Tissues. B. Jolles.—p. 110.  
Symptomatic Leukemia. H. G. Hadley.—p. 113.

**Rassegna Internazionale de Clinica e Terapia, Naples**  
21:769-808 (Nov. 15) 1940. Partial Index

- \*Placental Extract in Exanthematic Diseases. M. Bassi.—p. 771.  
Test of Galactosuria in Diagnosis of Function of Liver in Calculous Cholecystitis. P. Emiliani.—p. 783.

**Placental Extract in Exanthematic Diseases.**—Bassi employed placental extract treated with phenol for prevention of measles in 192 children. All but 4 proved to be immunized. Measles was mild in the 4 children who had it. One child who was not given the preventive injection because she stated that she had had the disease acquired it. The author administered this treatment to 7 young adults with scarlet fever, measles or varicella. The extract was given intramuscularly in daily doses of 4 or 5 cc. for three or four days. The course and duration of the disease were mild in all the patients. The author believes that placental extract is of preventive and therapeutic value in exanthematic diseases. The earlier the treatment the better the results. The treatment attenuates the disease and prevents complications.

**Klinische Wochenschrift, Berlin**

19:1153-1176 (Nov. 9) 1940. Partial Index

- Range and Technic of Serodiagnosis of Tuberculosis. K. Beller.—p. 1153.  
\*Hepatic Cirrhosis and Hepatargy on Allergic Basis. F. E. Schmengler.—p. 1155.  
Question of Centrally Conditioned Disturbances of Cardiac Rhythm (Temporary Extrasystole in Internal Hydrocephalus). F. Brauch.—p. 1157.  
Prevention of Serum Disease: Study of Problem of Immunity. E. A. Voss.—p. 1159.  
Histamine Content of Blood of Smokers. E. Werle and G. Effkemann.—p. 1160.  
Alteration of Reaction of Organism in Experimental Eczema. F. Koch and H. Buchwald.—p. 1162.  
Short Wave Cardiography a New Method for Clinical Examination. L. Rósa.—p. 1163.  
Behavior of Aneurin (Thiamine) and of Pyrophosphate of Thiamine (Cocarbonylase) in Blood in Tolerance Test with Vitamin B<sub>1</sub>. S. Molnár and M. Horányi.—p. 1165.

**Hepatic Cirrhosis and Hepatargy on Allergic Basis.**—According to Schmengler's investigations the liver is involved in all processes which develop on the basis of a general allergic reaction. The symptom of this involvement can be demonstrated in a large percentage of cases of urticaria, Quincke's edema, rheumatism, serositis and polyserositis, asthma, acute glomerular nephritis, scarlet fever and some cutaneous diseases. Usually the hepatic damage is latent and without much significance. In some cases it is so pronounced as to overshadow all other symptoms. Since sensitization of the liver can be brought about by way of the portal circulation as well as by the systemic circulation, allergic injury of the liver can be caused by infectious foci as well as by disturbances in the gastrointestinal tract. Hepatic cirrhosis can be produced not only by alcohol but also by various toxins, which indicates that the development of this disease must also be possible on the basis of an anaphylactic reaction. It has been suggested that the so-called serous hepatitis might be the hitherto unknown first stage of hepatic cirrhosis. The author reports 2 cases which he regards as proof that hepatic cirrhosis might develop on the basis of an antigen-antibody reaction. The first patient was subject to hay fever and asthma. The hepatic impairment here was demonstrated by a severe disturbance in the galactose tolerance and a strongly positive Takata reaction. The second patient repeatedly developed severe urticaria after eating fresh fish. One severe and prolonged attack of urticaria was finally controlled by a strict diet. The patient then completely abstained from fish and was free from urticaria. Three weeks before the present hospitalization she had again eaten fish and on the following day she had a recurrence of urticaria, nausea and vomiting. Jaundice developed, and the skin had become a dark greenish yellow. The general condition became greatly impaired, and the patient died in coma. Necropsy disclosed cirrhosis. Nature has provided in these 2 cases more convincing proof than could be furnished by artificially induced experiments. Katsch once observed acute yellow necrosis of the liver following urticarial mani-

festations on the skin, but he failed to provide an explanation. The 2 cases reported here prove that serous hepatitis, latent liver damage, cirrhosis of the liver and hepatargy are a pathogenic and etiologic unit developing on the basis of a repeated allergic impairment.

### Medizinische Klinik, Berlin

36:1123-1150 (Oct. 11) 1940. Partial Index

Estimation of Articular Lesions. E. Güntz.—p. 1123.

\*Bechterew's Spondylarthritis Ankylopoietica with Special Reference to Incipient Stages and Atypical Forms. M. Eltze.—p. 1125.

Duodenal Ulcer and Iron Metabolism: Symptomatic Erythrocytosis. K. Hitzengerber and W. Blumencron.—p. 1131.

\*Thrombopenic Hemorrhages After Repeated Administration of Sedormid. H. Schäfer.—p. 1133.

**Bechterew's Spondylarthritis Ankylopoietica.**—Eltze reviews the pathologic anatomy and then describes the clinical picture of completely developed ankylopoietic spondylarthritis. Since early recognition is of great importance for effective treatment, he gives special attention to the incipient stages. The disease is sometimes preceded by rheumatic purpura or by nodose rheumatism of the scalp. An iritis may be the clinical sign of rheumatism. Neuralgias in the sciatic nerve, particularly if they are bilateral, and prolonged pain in the back make it advisable to resort to roentgenoscopy of the pelvis. This will frequently disclose changes in the sacroiliac articulation. The articular clefts are indefinite, and the articular surfaces appear as if gnawed on. Inflammatory niches are interspersed with narrow bone bridges, which gradually become wider. Cloudy densifications of the bone appear near the articular clefts. From one to three or even more years may elapse before these changes become visible in the roentgenogram. Limitation of the respiratory excursion likewise may occur early. The sedimentation speed of the erythrocytes is nearly always increased during the early stages. The rigidity of the vertebral column should make the observer think of ankylopoietic spondylarthritis. In the severe forms, complete stiffening and ossification take place within a few years or a decade and the patients become completely helpless. The benign form develops more slowly, in that two decades may elapse before the patient becomes incapacitated; the stiffening is usually not so severe in these cases. The atypical forms of ankylopoietic spondylarthritis are characterized by the fact that not only the large joints near the trunk (shoulder and hip joints) are diseased but also the more distal ones, that is, the elbow, hand, finger, knee and foot joints. Rheumatic heart disease may also exist. The recognition of the atypical forms is difficult because the clinical symptoms are often slight in spite of chronicity. However, if Bechterew's spondylarthritis ankylopoietica is thought of and sought, diagnosis is possible, particularly if the vertebral column is held rigid and the sacroiliac joint exhibits changes. To differentiate ankylopoietic spondylarthritis from spondylosis, it should be considered that spondylosis is due to wear and develops in persons of advanced age, whereas ankylopoietic spondylarthritis develops in the second or third decade of life although it may remain long unrecognized, so that it is not diagnosed until spondylosis causes the first complaints. Spondylarthritis ankylopoietica involves the entire or large portions of the vertebral column, whereas spondylosis is limited to a few vertebrae. There is no flattening of the physiologic lumbar lordosis, no increase in the sedimentation speed of the erythrocytes and no change in the sacroiliac joint in patients with spondylosis. The bridge formations on the vertebrae are thick in spondylosis, thin and shell-like in ankylopoietic spondylarthritis. The vertebral bodies are of glass-like transparency in ankylopoietic spondylarthritis, whereas their density is rather increased in spondylosis.

**Thrombopenic Hemorrhages After Sedormid.**—Schäfer reports the histories of 2 patients who developed thrombopenic hemorrhages after taking the hypnotic preparation sedormid (allyl-isopropyl-acetyl-carbamide). One case had a relatively mild course. In this case two tablets were necessary to elicit the symptoms, whereas in the other case a single tablet produced severe and prolonged hemorrhages and disturbances in

the general condition. The thrombopenic hemorrhages produced by sedormid usually terminate in complete cure, but if the physician does not know of the intake of this hypnotic he may diagnose a true thrombopenia. The author deplors the fact that sedormid in contradistinction to other, probably less harmful, barbituric acid hypnotics is obtainable without prescription. The author thinks that the firm marketing this hypnotic should at least be obliged to declare on the label the possibility of the development of hemorrhages of the skin and the mucous membranes.

### Zeitschrift f. d. ges. Neurol. u. Psychiatrie, Berlin

170:131-282 (Aug. 27) 1940

Aspects of Diffuse Cerebral Sclerosis: Case of Familial, Late Infantile Type. O. Brandberg and E. Sjövall.—p. 131.

\*Question of Ovarian Insufficiency in Mothers of Children with Mongolian Idiocy. H. Schröder.—p. 148.

Epileptic Aura. W. C. Weber and R. Jung.—p. 211.

**Ovarian Insufficiency in Mothers of Children with Mongolian Idiocy.**—Schröder studied sixty families in which mongolian idiocy occurred and obtained from the mothers detailed personal data on menstruation, the course of the pregnancy and birth of the mongolian idiot, gynecologic disorders and systemic diseases. After presenting the casuistics, he discusses such factors as belated menarche, disturbances of the menarche, persisting menstruation during pregnancy, disturbances in the menstrual cycle, ovarian and other gynecologic disorders, the menopause, signs of incretory disturbances and general diseases. Summarizing his observations he says that less than one fifth (11 of 60) of the mothers of children with mongolian idiocy had indications of an ovarian insufficiency in connection with the pregnancy resulting in the birth of the mongolian idiot. Control investigations on 60 mothers of normal children revealed similar disturbances in 18 cases at the time of conception or during gestation. Thus ovarian insufficiencies are of not more than average frequency in mothers of mongolian idiots. The author reaches the conclusion that Geyer's hypothesis, which ascribes the development of mongolian idiocy to the fertilization of ova the plasma of which had been impaired because of ovarian insufficiency in the mothers (dysplasmatic ova), cannot be corroborated.

### Jahresb. d. Kurashiki-Zentralhosp., Kurashiki

15:1-94 (Dec.) 1940. Partial Index

\*Influence of Deuteron-Deuteron-Neutron Rays on Blood Picture of Rabbits. H. Tatiiri and H. Ueda.—p. 35.

**Deuteron-Deuteron-Neutron Rays and Blood Picture.**—Tatiiri and Ueda report their observations on the changes in the blood picture of rabbits treated with deuteron-deuteron-neutron irradiation, which contains no gamma rays, and compare the effect thus obtained with that of radon-beryllium rays containing the gamma rays. The source of these radiations was the Nontaka modification of the Cockcroft-Walton apparatus, and the irradiation was given over the epigastrium of the animals for periods varying from five to sixty minutes at a distance of 10 cm. As a rule the principle effect of the irradiation was a significant diminution of white blood cells, a left shift of the pseudo-eosinophilic granulocytes and a particularly striking destruction of lymphocytes. Initial leukocytosis was observed in animals receiving irradiation for short durations (five to twenty minutes) but never in animals receiving longer intervals of irradiation (forty to sixty minutes). This constitutes proof of the fact that the neutrons, like other rays, obey the law of Arndt-Schulz. In comparison with the influence of radon-beryllium irradiation, the authors note one decided difference, namely that radon-beryllium irradiation exerts a much greater effect on the lymphocytes than does comparable amounts (millicurie units) of either the neutrons or the gamma rays from radon, but not more so than the combination of the two. This can mean only that the destructive effect of the radon-beryllium rays on the leukocytes results not merely from the simple summation effects of neutrons and gamma rays but from a complicated and synergistic effect of the two kinds of rays.

# THE STUDENT SECTION

of the

## Journal of the American Medical Association

*Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals*

SATURDAY, MAY 31, 1941

### Opportunities for Surgeons in Medical Research

WARREN H. COLE, M.D.

CHICAGO

The most important opportunity, which, indeed, I would call an obligation and privilege, of the Society of University Surgeons is the participation in surgical research by its individual members. But first let me emphasize that I do not imply that every member must do research. It is well that our membership includes a variety of surgeons. Though surgeons have contributed much they have perhaps the rare and shameful distinction of having hardly a single society organized for the primary purpose of scientific investigation. The internists have two or three societies designed almost solely for the purpose of research; one of them, the Central Society for Clinical Research, benevolently maintains a small quota of their membership for surgeons. All of us are aware of the necessity for research in the progress of surgery. Since the membership of the society contains men all of whom are in the so-called age of research productivity, and since it is made up of men engaged in academic activities, it becomes imperative that we concentrate on research.

To emphasize still further the importance of research let me refer to some quotations by the physiologist Claude Bernard. With the exception of Pasteur, no man has been responsible for more rapid strides in medicine, in an equivalent length of time, than Bernard. The book he wrote in 1865 on *Experimental Medicine*, which was translated into English in 1927, is a masterpiece on the philosophy of research and cannot fail to inspire any of us. If you have not read it, I would urge you to do so. You will find it a splendid antidote for that depressed feeling which follows a day when all experiments go wrong and nothing seems to have been accomplished. There is one danger, however, which the reader must fight against in reading this volume: he must take care lest the brilliance yet simplicity of Bernard's reasoning inflict on him an inferiority complex. Bernard presented

medicine with so many illustrious advances only because he began his contributions early and persisted in his endeavors during even the latter days of his sixty-five years of life.

Early in his book it is obvious that Bernard wants it to be clearly understood just how important research is to progress in medicine; he remarked "Experimentation is undeniably harder in medicine than in any other science; but for that very reason it was never so necessary, and indeed so indispensable. The more complex the science, the more essential it is, in fact, to establish a good experimental standard, so as to secure comparable facts, free from sources of error. Nothing, I believe, is today so important to the progress of medicine." He repeats these thoughts, in different words, in many places throughout the book, thereby clearly indicating his belief in the importance of research work to medical science. He paid tribute to the great men of science by remarking that "It is in the darker regions of science that great men are recognized; they are marked by ideas which light up phenomena hitherto obscure and carry science forward." Yet he offered some slight solace to those of us outside the classification of great men by adding "Mediocre men often have the most acquired knowledge."

Although it is a well known fact that comparatively few men have the mental attributes to be successful research men, it is equally well known that men may be very intelligent without having the knack of being proficient in research. While originality is one of the most important attributes necessary, many additional characteristics indeed are required to produce men like Bernard and Pasteur. No more than two or three such geniuses will be encountered in any single century. There is great danger in attaching too much importance to originality, since a man with perseverance and industry, though lacking originality, is more apt to be productive (particularly if well guided) than a man displaying originality but lacking the tenacity to complete a long problem.

Part of the Presidential Address Delivered at the Third Annual Meeting of the Society of University Surgeons, St. Louis, Feb. 14, 1941.



Innumerable characteristics are therefore desirable and even necessary in the successful experimentalist. An astute power of observation is important indeed as exemplified by Bernard's story of his discovery of the relationship of the pancreas to fat digestion. He was operating on some rabbits while working on another problem when he discovered that white milky lymphatics were visible on the lower part of the duodenum beginning at about the point where the pancreatic duct emptied into the duodenum. More direct experiments dealing with the action of pancreatic juice on fats proved the suspected role of pancreatic juice in fat digestion. This experiment successfully illustrates how related or side problems may be much more important than the original problem. All of us have seen plenty of examples of this truth and in fact have had it happen to us. Unfortunately, these side problems can chase one up blind alleys at an amazing rate of speed, as most of us can again verify. Even the wary eye of a wild duck can be deceived by a dab of color properly placed on a wooden decoy. I hope none of you have been deprived of the pleasure of first hand experience in the demonstration of that phenomenon.

To get the most out of experimental work, one must at all times be an opportunist. Off-hand, we might think that none of us would fail to take advantage of an opportunity when encountered in our path. Yet the old master himself (Bernard) pays a kindly tribute to William Beaumont for having the foresight to turn circumstances to profit when Alexis St. Martin came to him with a hole in his stomach.

Failure to interpret results accurately is a frequent error and destroys the significance of many a problem. Too often indeed does the experimenter let coincidence lead him astray into fields of thistles and cactus. Bernard wrote that "coincidences form one of the most dangerous stumbling blocks encountered by experimental scientists in complex sciences like biology. It is the *post hoc, ergo propter hoc* of the doctors, into which we may very easily let ourselves be led, especially if the result of an experiment or an observation supports a preconceived idea." The latter mistake is equally important and common. Bernard consumes no less than thirty pages in condemning the habit of starting on the dangerous mission of proving a preconceived idea. Variations in results are the bugbear of all scientists. However, Bernard took pains to issue a warning as follows: "Nothing is accidental, and what seems to us accident is only an unknown fact whose explanation may furnish the occasion for a more or less important discovery." It was utilization of this philosophy that led Bernard to the discovery of the role of the liver in carbohydrate metabolism with conversion of glycogen to sugar and vice

versa. He found wide variations in his analyses of the sugar content of animals' liver; these variations consisted chiefly of higher readings several hours after removal of the liver from the body than at the time of removal. It was because he had faith in his analyses and repeated the experiments many times that he finally demonstrated without question the role of the liver in carbohydrate metabolism.

Scientists are continually being criticized for working on problems and issuing reports with doubtful value. Yet Bernard often makes the statement that there is no such thing as an unsuccessful experiment. He voiced my feelings exactly in his remarks, which cannot be improved on: "I therefore refuse to acknowledge that science has a place for men who make criticism their specialty, as in letters and in the arts. To be really useful, criticism in every science must be done by men of science themselves, and by the most eminent masters." In other words, no one knows at what time certain seemingly trivial data may be picked up by an opportunist and crystallized into an epoch making discovery by utilizing some additional data. After all, does it not seem a far cry from Dam's experiments on a bloody diarrhea in chicks, or Roderick's demonstration of hepatic disease in sweet clover disease of cattle, to the development of vitamin K? Perhaps it does, yet these two insignificant experiments gave rise to the dramatic and useful discovery of prevention of hemorrhage in jaundice. All of us, when we stop to think, can recall to mind many such instances when major discoveries were made possible by some trivial, seemingly insignificant, experiment.

Medical scientists fully realize that animal experimentation is a much better medium for development of important data than a flock of test tubes and inorganic bodies. It is likewise granted that the human being is a much better guinea pig than the four legged genus *Cavia porcellus* himself. We must realize, however, that while we are finding 8 or 10 patients with the proper symptom complex we might have completed a hundred or more experiments on animals, thereby tending to eliminate the statistical error of the time worn apology "a small series." Moreover, we must constantly ask ourselves that simple question Are my experiments jeopardizing the patient's health or chance of recovery? Again, Bernard touched the crucial point when he said "The principle of medical and surgical morality therefore consists in never performing on man an experiment which might be harmful to him to any extent, even though the result might be highly advantageous to science, i. e., to the health of others. But performing experiments and operations exclusively from the point of view of the patient's



own advantage does not prevent them turning out profitably to science."

The young ambitious medical scientist, more saturated perhaps with the vision of glory than with the persevering, analytic astuteness of a seasoned scientist, may in desperation and disgust say "Why work any more; all discoveries of importance have already been made?" Of course, we are all aware of the fallacy of that remark and realize that the addition of scientific facts as compiled year after year increases the chances of development of epoch making discoveries in a geometric ratio. True enough, the chances of making epochal discoveries in the mechanics of operative principles are being diminished; not so though with the physiologic principles involved in operations. Still more fruitful are the physiologic principles which can be utilized for the patients' welfare before or after operative procedures are performed.

As all of us fully realize, the benefits derived from the practice of medicine or surgery may be threefold: (1) personal satisfaction or happiness, (2) financial reward and (3) creation of

an enviable professional reputation. All of the peers and seers of medicine as far back as the hippocratic era remind us of the serious accusations hurled at the monetary instinct. It is axiomatic that indeed few surgeons of the academic group (exemplified by this society) chose that path for the monetary compensation obtainable. Naturally, they elected to spend the majority of their time in institutional work for the personal satisfaction derived from work itself or the reputation created. I have no doubt that all the members of this audience are well aware of the curious fact that the short cut to an enviable national reputation lies in the corridors which traverse the halls of experimental medicine and surgery. The esteem of one's fellows, beyond his local environs, can be achieved in about half the time required by concentration on purely clinical medicine or surgery. It is likewise self evident that because of his lasting contributions to mankind this type of doctor will always be in demand. May his kind flourish and prosper!

1853 Polk Street.

## The Function of the Museum in the Medical School

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Various types of museums find their place in the medical school. The chief of these are the anatomic museum and the pathologic museum. It is with the latter that this paper deals. I should prefer, however, to refer to it as the medical rather than the pathologic museum, because the latter term suggests a series of specimens in bottles, and the museum should be very much more than that.

The old museums were storehouses for pickled specimens, and such great collections as those of the German universities, the London hospitals and the Royal College of Surgeons in London and in Edinburgh played a great part in their day and still do so. But the modern tendency is to make things easier for the student, which can best be done by making them more interesting. This can be accomplished by presenting more than one aspect of a subject and by presenting the subject in as attractive a manner as possible. Those who visit the great Army Medical Museum at Washington will see both of these principles put into practice, and the scientific exhibits at the meetings of the American Medical Association are a striking demonstration of the drawing power of perfectly arranged displays.

I have had the experience of converting two of the classic forms of museum into something

more modern in type, the one in Winnipeg, the other in Toronto. The basic principle underlying the work was the same in the two instances, but there was one difference worth noting. In Winnipeg the museum, as is commonly the case, consisted of one large room (although later a second was added), whereas in Toronto there was a large number of small rooms, one for the circulatory system, one for the nervous system, and so on. The convenience of the latter arrangement for teaching a number of groups is self evident.

The aim has been to make a clinicopathologic museum, a museum depicting disease in all its aspects. This is done by displaying, in addition to the gross specimens, illustrations of clinical conditions, microscopic appearances, roentgen ray findings, temperature charts, blood pictures, and so on. Nor is the historical side of medicine neglected. A few examples will illustrate the general idea. In the section on Addison's disease, in addition to the lesions of the adrenals there is a water color painting of a patient showing the characteristic bronzing of the skin, another of the pigmentation of the mouth and tongue, and a picture of Thomas Addison with a short biographic sketch. Exophthalmic goiter is illustrated by a picture of a patient with exophthalmos and enlarged neck, gross specimens of the thyroid, the microscopic picture and a representation of Robert Graves with biographic

Read before the joint meeting of the Council on Medical Education and Hospitals and the Federation of State Medical Boards of the United States at the Thirty-Seventh Annual Congress on Medical Education and Licensure, Chicago, Feb. 18, 1911.

notes. The section on glomerulonephritis is illustrated by a picture of Richard Bright, plates from Volhard and Fahr's classic monograph, a painting of the fundus showing albuminuric retinitis, and Oliver's reconstructions of the nephrons in chronic nephritis.

Instead of multiplying these examples endlessly, I will mention some details of the methods of display. One fundamental principle has been observed, namely that it is more restful to study a specimen when it is inclined than when it is upright. For this reason the ordinary museum display cases with horizontal shelves have been replaced by open stands of sloping shelves. There are five tiers of these shelves, and the whole fixture is painted white. The classic glass museum jars are not suitable for the narrow ledges which separate these shelves, but watch glasses of various sizes are admirably adapted to this purpose, as also are narrow glass cells which can be readily made by the technician. Both of these are much cheaper than the glass jar.

On the wall above the display stand there is a wooden board which serves to carry the various pictures. These illustrate the specimens on the shelves beneath. Attached to the lowest shelf there is a narrow box containing cards 7 by 8 inches in size. These are of sufficient size to contain a condensed copy of the catalogue description; indeed they replace the former catalogue. The back of the card can be used for a photomicrograph of the lesion, the whole being covered with bexoid and bound with fiber reinforcing tape. The advantage of this arrangement is that the student can sit down, study the specimen and read the description without having to move.

Pictures are of special value in the large room devoted to general pathology. Colored illustrations of the various fat, glycogen and amyloid stains recall to the student what he has seen or should see through the microscope. The inclusion bodies of virus diseases can be collected to form one composite picture. Another such picture shows the life cycle of the malaria parasite in man and in the mosquito, the anophelines mosquito compared with the culex, the temperature charts of tertian and quartan fever, the parasites in the brain and the pigment in the spleen. A third shows a map indicating the geographic distribution of trypanosomiasis, the trypanosomes in the blood, the tsetse fly, the lymphadenopathy and the native lying in his hut in the last stages of stupor. Colored illustrations of the rashes, mucous patches and condylomas of syphilis are surely as instructive as specimens of gumma and are absolutely necessary to complete the picture of the disease. There are hundreds of beautiful colored plates hidden away in atlases which remain unopened for years on library shelves. The best use to

which an atlas can be put is to have its pictures torn out and displayed.

A feature of psychologic value is the use of the principle of what may be called paragraphing. In the bone room, for instance, the main disease groups such as osteomyelitis, tuberculosis and tumors are separated from one another by broad vertical strips of black cellophane. The individual members of such a group as bone tumors (osteogenic sarcoma, Ewing's tumor and others) are separated by thin green strips. The main groups are indicated by large labels on the wall, the subgroups by smaller labels at a lower level. This paragraphing not only makes it easy to find all the specimens of any given disease but enables the observer to carry away a visual memory of any particular group in which he may be interested.

In each of the small rooms a large viewing box is installed, which can be used for roentgenograms or transparencies of photomicrographs, clinical pictures or paintings of blood films. This box is deep enough to accommodate half a dozen wooden frames, each large enough to carry twelve 5 by 7 inch reductions; it is high enough so that all the frames can be pushed up out of sight above the limits of the glass. In the lung room one frame is devoted to tuberculosis, one to suppurative conditions, one to tumors, and so on. Whichever one is wanted is pulled down, so that the films are in front of the illuminated glass.

It will be evident that this type of museum is designed for the teaching not only of pathology but also of medicine and surgery, for it is a museum of disease and not merely of pathologic specimens. It is for the use not only of undergraduates but also of graduates and especially of those preparing themselves for the higher examinations. It is a museum of which it may be said that it is "a library composed, not of books, but of the things themselves about which books are written."

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Medicine Antedates the Inception of Civil Law.—Medicine is the most ancient of professions, being older than Christianity and antedating the inception of civil law. It has its own system of rewards and punishments, its own disappointments and its own glories. It is a profession that has a broadening influence on the human mind and is characterized by a most splendid charity. It is an acquisition in the best tendencies and a protection against the worst tendencies. It retains for its profit no valuable discovery and it has no standing room for the quack, the scoundrel and the charlatan. Its best work is done in the light which beats upon its throne, not in the arena of politics encouraged by the cheers of thousands, not in the seclusion of the cloister sustained by the hope of eternal joy, but in the storm and wind swept country, in the streets of the village, in the boulevards of the city, on the desolate field of battle, where pain and pestilence, illness and misery are combated often with none but God to see it. It furnishes a curiously checkered life, a life in which storm clouds alternate with sunbeams.—Abell, Irvin: *The Spirit of Medicine, Pharos of Alpha Omega Alpha*, May 1941.

## Digests and Reviews

### TUBERCULOSIS AMONG STUDENTS AND GRADUATES OF MEDICINE

*Abstract of an article by J. A. Myers, H. S. Diehl, Ruth E. Boynton, P. T. Y. Ch'in, T. L. Streukens and Benedict Trach in the Annals of Internal Medicine, March 1941.*

We have attempted to trace the 1,894 medical students who graduated or were scheduled to graduate from the University of Minnesota from 1919 to 1936 inclusive. Group 1 includes 1,441 students in the graduating classes from 1919 to 1932 inclusive, and group 2 includes 453 students in classes graduating from 1933 to 1936. Prior to 1929 no special routine examination for tuberculosis was made of students. Consequently information on group 1 was obtained largely through questionnaires. Information concerning 7.5 per cent of the entire group was not obtained.

#### GROUP 1

There were 1,304 replies from the members of the classes of 1919 to 1932. Forty-one (3.14 per cent) stated that clinical tuberculosis developed while they were in school. Ten others reported having had pleural effusions as students and 5 others that they had tuberculosis before entering medical school. Also 41 of the remaining 1,248 graduates (3.29 per cent), including 4 with pleural effusion, reported that tuberculosis developed in them after graduation from medical school. Thus, exclusive of the 5 who had tuberculosis before entering medical school 92 (7.07 per cent) have had the clinical disease while in school or since graduation. Of these, 11 (0.85 per cent) have died of tuberculosis.

Concerning tuberculin reactions, 389 have either had no tests or do not remember the results. Reactors to tuberculin varied from 15 to 33 until 1925, whereas the percentage of graduates who either had no tests or did not remember varied from 46 to 62 during this same period. In 1925 a tuberculosis service was made compulsory and in 1929 routine annual testing of all medical students was begun. The number reporting reactions has risen sharply since then, while the number who were not tested or do not remember has shown a sharp decrease. The 1932 class recorded 85 per cent reactors and only 3 per cent with no tests.

#### GROUP 2

The 453 students who entered the School of Medicine from 1929 to 1932 inclusive were carefully examined throughout their enrolment. The entire class entering in 1929 was tested with tuberculin and had annual roentgenograms of the chest regardless of the tuberculin reaction. The nonreactors on entrance were retested annually unless they became reactors. The

members of the other three classes had tuberculin tests on entrance and annually or more often as long as they were nonreactors. Four of the 453 have died of nontuberculous diseases, leaving 449 students.

The percentage of reactors in these classes ranges from 33.3 to 37, while on graduation the percentage is from 57.7 to 77.9. The average in the four classes is 35.6 per cent on entrance, 41 per cent at the end of the third year and 67 per cent at the end of the fourth year, and 50.2 per cent of those who reacted negatively on entrance became positive before graduation. While there was an increase of reactors between entrance and the end of the junior year, the increase was greater during the senior year. Of the 449 students, 160 reacted to the test on entrance, 145 became reactors while in school and 144 were nonreactors on graduation.

Replies have been received from 369 of the 449 graduates. Of these 102 were from physicians who did not react to tuberculin at the end of the senior year. Sixty-five of these have had tuberculin tests since graduation, 30 of whom became reactors as interns, 15 following their internships and 20 are still nonreactors.

Although few of these graduates interned at hospitals requiring tuberculosis services, practically all were exposed to the unsuspected contagious ease of tuberculosis admitted for some other coexisting condition. Moreover, most of these hospitals do not examine the members of their own personnel. To allow 46.2 per cent of uninfected interns to become infected during their hospital services constitutes a serious problem in tuberculosis control. From our observations among these physicians while they were students, together with their replies to our questionnaires, we now know of 350 (78.2 per cent) who react to tuberculin.

Students in the College of Education, the control group, came from the same general section of the country and while in school lived in the same general environment as the students of medicine except that they were not brought in direct contact with tuberculous patients as a part of their work. On entrance to the College of Education 24.8 per cent of the students reacted to tuberculin, while on graduation the percentage was 28.5. Thus, only slightly more than 1 per cent of the nonreactors became infected each year.

On entrance to the School of Medicine there were 160 students in the classes of 1933-1936 who had primary complexes as manifested by the tuberculin reaction. Five of these students are known to have since had diagnoses of clinical tuberculosis, a percentage of 3.1 as compared to 0.41, or 3 among 686 reactors from the Col-

lege of Education students. Of the 145 students in group 2 in whom the primary tuberculosis complex as manifested by the tuberculin reaction developed while in school, 14, or 9.6 per cent, have had lesions demonstrated as against the 3 among the College of Education students. However, 4 of the 14 had evidence only of primary foci located by roentgen study, 5 had only pleurisy with effusion, extrapulmonary clinical tuberculosis developed in 1, and clinical pulmonary disease developed in 4. The remaining 131 would not have known of the tuberculosis had it not been for the periodic tuberculin test.

Five of 45 students who replied to our questionnaire and stated that they had become tuberculin reactors since graduation have shown evidence of lesions on roentgen examination. Thus among the 305 students of medicine who were tuberculin reactors on entrance or who became reactors while in school, lesions which were located by roentgen or other methods of examination have developed in 18 as against the 3 in a total of 686 College of Education students who reacted to tuberculin either on entrance or subsequently. Neither in the School of Medicine nor in the College of Education do we know of any one in whom tuberculosis developed in the absence of a tuberculin reaction.

This study emphasizes, in addition to the hazards of exposure, the fact that the entire span of life must be considered in every case of tuberculosis whether the diagnosis is made by the tuberculin test alone or together with the demonstration of the location of lesions. In these students we have seen the evolution of tuberculosis: the history of exposure, the first tuberculin reaction, occasional location of the primary focus on roentgen examination and the reinfection type of lesions in the lungs. The procedure carried out in group 2 represents our future course in tuberculosis control.

### PULMONARY TUBERCULOSIS IN MEDICAL STUDENTS

*Abstract of an article by Richard G. Hahn, Carl Muschenheim and Jules Freund, published in the American Review of Tuberculosis, May 1941.*

The present communication is a report of the results of tuberculosis case finding applied to groups of medical and nursing students at the Cornell University Medical College and the New York Hospital.

The methods employed were the intracutaneous tuberculin test and the roentgenographic examination of the chest. The reactions were read two days after the intracutaneous injections and were considered positive if the skin was raised over an area of a diameter of 5 mm. or more. The roentgenograms of the chest were made in the roentgen ray department of the hospital with standard technic, single postero-

anterior views being used. Tests were made on first year medical students and student nurses within two months of admission to their respective schools and during the last month of their final year.

#### RESULTS WITH MEDICAL STUDENTS

Six first year classes were tested. The percentage of positive reactors varied from 75 to 89. Collectively, of the 315 first year students tested 259, or 82.2 per cent, were positive and 56, or 17.7 per cent, were negative. Fourth year classes graduating in 1935, 1936 and 1937 were similarly examined. Of the total of 147 tested 135, or 91.8 per cent, were found positive and 12, or 8.1 per cent, were negative. The incidence of positive reactors in the fourth year classes tested was thus 9.6 percentage points higher than in the first year classes. The percentage of negative reactors shortly before graduation in both the medical and nursing student groups has varied in different years from zero to 14.3. The average for the nursing student (of the classes of 1933 to 1939 inclusive) has been 6 per cent negative on graduation and, for the medical students, 8.7 per cent.

#### CHEST ROENTGENOGRAPHY

The medical students have had yearly roentgenograms of the chest since 1934. A total of 442 students each had at least one roentgenographic examination. Seventy-one, or 16.1 per cent, had calcified deposits in the tracheobronchial lymph nodes, in the pulmonary parenchyma or in both. These were interpreted as healed lesions of the childhood type. In 22, or 5 per cent, there were shadows at either or both of the extreme apexes of only several millimeters thickness. These were interpreted as thickening of the apical pleura with possibly some parenchymal involvement. This group was classified as doubtful. The calcified shadows and the doubtful apical shadows were found in every instance in the student's initial roentgenogram. None appeared in subsequent roentgenograms of those whose original film had been entirely negative. There was also no instance in which these shadows changed during the period of observation and, incidentally, no student whose initial film revealed either type of shadow was in the group in which definite pulmonary infiltrations developed later. Five, or 1.1 per cent, had shadows characteristic of chronic pulmonary tuberculosis in the initial roentgenogram. The lesions were all minimal in extent. Only 2 of the 5 were found in the first academic year. The other 3 belonged to the classes of 1934 and 1935, which were not roentgenographed until their fourth and third years, respectively. Four other students, or 0.9 per cent, who had been negative in their initial

roentgenographic examination developed shadows characteristic of chronic pulmonary tuberculosis in subsequent years. Three were minimal and one was moderately advanced when found. None had complained of any symptoms before the lesion was discovered. In addition to having shown no roentgenographic evidence of tuberculosis, 3 of the 4 had originally been negative to 1 mg. of tuberculin. These 9 students, 2 per cent of the total, who were discovered to have chronic pulmonary tuberculosis, represent the entire number of cases found, including the apparently arrested as well as those in which progressive disease was demonstrated. Four of the 9 had lesions which were obviously progressive and these students were referred to sanatoriums immediately after discovery of the disease. The other 5, for various reasons not under our control, were allowed to continue at work and complete their course. Of these there were only 2 in regard to whom we possess subsequent information sufficient to determine whether their disease was arrested at the time of discovery. One of these has never had any symptoms or physical signs attributable to his lesion, which has remained unchanged in serial roentgenograms over a period of four years. The other is known to have had progression of his disease since graduation. The average age of all the students on entrance to the medical school was 22.

The tuberculosis rate in the medical students does not appear to be significantly above the expected rate in their age group. The rates both in the nursing and in the medical students are considerably below those reported in some other institutions of similar nature. Whether the relatively low incidence of pulmonary tuberculosis in the student groups is due entirely to rather rigid precautions is problematic. That the students are not completely protected from new infections, whether acquired within or

without the hospital, is evident from the increase in the number of positive tuberculin reactors in successive years. Other factors which we think may contribute to the low rate of development of new lesions, at least in reference to the nursing students, are the conditions of housing and of nutrition which we believe to be exceptionally good, and the age of the students, who are somewhat older than in many other training schools. A high percentage of positive tuberculin reactors in our medical and nursing student groups on admission may indicate that most of them had a considerable degree of acquired resistance. Our experience would tend to support the observations of others that the students who are originally tuberculin negative are more likely to develop clinically significant disease than those originally tuberculin positive.

The incidence of pulmonary tuberculosis, inclusive of cases with arrested disease, was found to be 2 per cent for the medical students and 1.1 per cent for the nursing students. The incidence of new lesions developing after the initial roentgenographic examinations of entering students was 0.35 per hundred annually among medical students and 0.18 per hundred annually among nursing students.

It is our impression that asymptomatic tuberculosis in young adults eventually progresses in the majority of instances and should always be treated early. A definite policy, therefore, has recently been followed of recommending prompt treatment for all patients under 30 years of age in whom an infiltrative lesion has been discovered, regardless of the presence or absence of symptoms, the extent of the lesion or the results of sputum examinations and other laboratory procedures. We regard lesions presumed to be primary or first infection type as of as serious significance as those which appear to be the result of endogenous or exogenous reinfections.

## Correspondence

### SIGNERS OF THE DECLARATION OF INDEPENDENCE

*To the Editor:*—Dr. Ward called attention in the Student Section of THE JOURNAL, March 22, page 1331, to physician signers of the Declaration of Independence. However, the name of George Taylor, representing Pennsylvania, should not be included among them, as there is no evidence to this effect. The statement in the 1913 edition of Funk and Wagnall's "New Standard Dictionary" that he was a physician is apparently incorrect and was withdrawn from later editions. There is no mention of his being a physician in Kelly and Burrage's "American Medical Biographies," in F. R. Packard's "History of Medicine

in the United States" or in the "Dictionary of American Biography" (Scribners, New York). In John Sanderson's "Biography of the Signers of the Declaration of Independence," to be sure, it is stated that Taylor commenced the study of medicine but soon became disgusted with it and, according to the Bucks County Historical Society publications, "ran away from home."

I quite agree with Dr. Ward that the medical profession should know more medical history, and I hope that he will agree with me that, as such history should be as accurate as possible, even this small point deserves correction.

E. B. KRUMHOLTZ, M.D., Philadelphia.



## DO YOU KNOW WHAT PHYSICIAN—

1. Discovered the parasite of malaria fever?
2. Became Poet Laureate of England?
3. Wrote "Rab and His Friends"?
4. Was the pioneer in the graphic study of cardiac arrhythmias?

DO YOU KNOW WHAT ANATOMIST  
5. Painted what is considered to be the most famous portrait in the world?

DO YOU KNOW WHAT ZOOLOGIST  
6. Discovered the cause of syphilis?

*The answers are on page 2552.*

## Medical College News

*Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items for consideration for publication in the Student Section.*

## Rush Medical College to Merge with Illinois

The board of trustees of Rush Medical College, Chicago, has asked the attorney general of the state to prepare a court petition for dissolution of the ties of Rush Medical College with the University of Chicago in preparation for a merger of its educational elements with the University of Illinois College of Medicine. The question is now before the circuit court. The newspapers reported, May 3, that these proposals are the result of long and extensive negotiations with the board of the Presbyterian Hospital and representatives of the medical and fiscal divisions of the two universities. Presbyterian Hospital is the teaching hospital for Rush Medical College, and members of its staff are all instructors at the college. The proposed plan is (1) severing of affiliation with the University of Chicago which has been continuous since 1924, and (2) abolition of Rush Medical College as an educational institution but retention of the Rush board to administer the physical properties of the college. Subdivisions of this main plan call for the absorption of all Rush medical instructors into the University of Illinois College of Medicine and affiliation of the Presbyterian Hospital with the state university's medical department. The Rush name will not be lost under the setup in that the Rush teachers will be known as Rush professors of the University of Illinois College of Medicine. The Rush buildings will be leased to the hospital for expansion purposes and possibly as instruction rooms for the medical students at Illinois. At this time there are about two hundred undergraduates in Rush Medical College in the junior and senior classes. The University of Chicago has agreed, according to the program, to graduate the junior class, but no more students will be accepted by Rush and the 1942 class will be its last. There will be no graduate school at Rush as once was planned. The Central Free Dispensary, which is operated in cooperation with Rush Medical College, will be taken over as an outpatient hospital consolidated with Presbyterian Hospital, with the hope that the dispensary and the hospital can have identical boards of trustees.

## Loan Funds at Alabama

Students in the University of Alabama School of Medicine, University, maintain two loan funds, a fund for the purchase of library material pertaining to medical history, ethics and economics and a fund to provide a speaker each year in honor of Dr. William Crawford Gorgas. The Library Fund is known as the Freshman Memorial Library Fund and was established during the session of 1928-1929. Contributions are made voluntarily by practically all members of the freshman class. The librarian and the dean, ex officio,

and two members of the faculty administer the fund. During the past decade more than six hundred volumes have been purchased, the *Annals of Medical History* subscribed for and portraits of James Marion Sims, John Y. Bassett and John Wyeth, all famous Alabama physicians, secured.

The James Marion Sims Loan Fund was spontaneously founded last year by voluntary subscriptions of the freshman class, varying in amounts from 50 cents to \$35. The present freshman class has followed the procedure established last year. The professor of anatomy and the dean of the school, with a certified public accountant from the commerce faculty, have been named trustees of the fund.

The other loan fund in the medical school was established last year by the Sigma chapter of Phi Beta Pi Medical Fraternity. This fund is administered by a faculty committee of five with the dean as ex officio secretary and treasurer.

In addition, Alpha Epsilon Delta, premedical fraternity, sponsors an annual program in association with the medical school, and this society last year also established the Alpha Epsilon Delta Loan Fund with the chapter's faculty adviser, an associate professor of biology, and the dean of the medical school, ex officio, with the same professor of accounting from the School of Commerce as the third member. All three funds are audited by a certified public accountant annually and reports made to the donors.

The Gorgas Medical Society consists of all students in good standing enrolled in the school after the first semester. All members of the society and members of the faculty contribute \$1 each with which a speaker is secured annually in honor of the birthday of Dr. William Crawford Gorgas of Alabama. This year Prof. Anton J. Carlson of Chicago will be the speaker. The Gorgas Medical Society in the school chooses annually a limited number of the sophomore class as Gorgas fellows. This is the highest honor awarded during the session.

## Oklahoma Seniors Apply for Commissions

Twenty members of the senior class of the University of Oklahoma School of Medicine, Oklahoma City, have applied for commissions in the Medical Reserve Corps of the U. S. Army. The commissions are being granted by the War Department, our correspondent states, with the understanding that these young physicians will not be called into actual military service until after completing one year's internship following graduation.

A plaque in honor of the late Dr. Leroy Long, dean of the University of Oklahoma School of Medicine for many years, was dedicated by appropriate ceremonies in the auditorium of the school May 19. The plaque



was erected by the Oklahoma State Medical Association and the alumni association of the medical school and was modeled by Joseph R. Taylor, associate professor of art at the university.

#### Pennsylvania's Annual Undergraduate Meeting

At the thirty-third annual meeting of the Undergraduate Medical Association of the University of Pennsylvania, the opening address, by Dr. John H. Stokes, was "The Young Doctor and the War." Dr. Cornelius P. Rhoads, New York, of the Rockefeller Institute for Medical Research and director of the Memorial Hospital for the Treatment of Cancer, spoke on "Chemical Aspects of Cancer," and A. Baird Hastings, Ph.D., Hamilton Kuhn professor of biological chemistry, Harvard University, Cambridge, Mass., on "The Case for the Intracellular Fluid." Papers on research were presented by nine students. The May Ellis Bell Prize was presented to Christian J. Lambertsen '43 for his paper on "A Diving Apparatus for Life Saving." The John G. Clark Prize was awarded to John C. Lilly '42 for his paper on "The Electrical Capacitance Diaphragm Manometer: A New Apparatus for Direct Blood Pressure Determination." The Grahye Simpson Priestley Prize was awarded to Martin G. Nelsky '43 for his paper "Some Effects of Desoxycorticosterone and Related Compounds on the Mammalian Red Cell." Miss Lillian B. Panzer '44 was given honorable mention for her paper on "Experimental Hypoprotrombinemia."

#### California's Gold Headed Cane

At the annual gold headed cane ceremony at the University of California Medical School, San Francisco, April 14, Robert H. Crede, a senior student, received the award. The guest speaker on this occasion was Dr. George Blumer, professor of medicine at Yale University School of Medicine, New Haven, Conn., who also was awarded a gold headed cane. A cane is given annually to the member of the senior class who is adjudged most likely in the opinion of his classmates and the faculty to be eminently successful in the profession. This ceremony is adopted from an old English custom in which a single gold headed cane was handed down through generations of eminent British physicians.

#### New Indiana A. O. A. Members

The following upper classmen at Indiana University School of Medicine, Bloomington, have recently been elected members of A. O. A. honorary scholastic society: Wallace E. Bash, Warsaw; Margaret Ann Bassett, Thorntown; Mary H. Beall, Rushville; Otis R. Bowen, Crown Point; Lawrence A. Cantow, New York; Jack Dick, Huntington; Laura Hare, Indianapolis; Edgar A. Hawk, New Palestine; John E. Heubi, Jeffersonville; Joe Humphreys, Cloverdale; Joe H. Jewett, Carmet; William W. Kriebel, Terre Haute; Griffith Marr, Columbus; Charles F. Martin Jr., Logansport; Sherman Minton Jr., New Albany; Theodore F. Schtaegel Jr., Indianapolis; Lawson F. Smith, Indianapolis, and James B. Warriner, Indianapolis.

#### Harvard Awards Christian Prize

John William Raker, a fourth year student, has been awarded the Henry A. Christian prize at the Harvard Medical School, Boston, which is given to a student in the senior class "who has displayed diligence and notable scholarship and offers promise for the future." Mr. Raker, who is from Kutztown, Pa., graduated from Bucknell University in 1937. The award was established a few years ago in honor of Dr. Henry A. Christian, professor of theory and practice of physics, emeritus.

#### Dr. Brücke Goes to East Indies

The fourth year students at the University of California Medical School, San Francisco, were recently addressed by Dr. Ernst T. von Brücke, of the physiology department of Harvard Medical School, Boston, who was en route to the Dutch East Indies, where he will engage in surgical work for the Dutch army. Dr. Brücke lectured on his surgical experiences with a Red Cross unit sent by the Netherlands to Ethiopia a few years ago and recently to Finland.

Among the seminars conducted recently at the medical school on the early medical history of California was one conducted by Dr. John B. de C. M. Saunders on "Chacon Daza, Author of the Earliest Textbook of Surgery on the North American Continent."

#### The Contin Society

Dr. Arthur Fishberg delivered the first annual lecture of the Contin Society, an honorary organization at the New York Medical College and Fifth Avenue Hospitals, New York, May 9, on "Recent Developments in Essential Hypertension." Dr. Samuel J. Kopetzky, chief of the medical division of Selective Service of the City of New York, addressed the annual induction meeting of the Contin Society, February 6, on the draft in relation to doctors, interns and medical students. The following students were inducted into the society: seniors—Milton Willner, Sidney Cramer and A. Winifred Phillips; juniors—Letizia Ciaramelli, Theodore Struhl, Thomas Benson and Abraham Uman-sky. The faculty members elected to honorary membership to this society were Dr. J. A. Werner Hetrick, acting dean and head of the department of otolaryngology; Dr. Renel A. Benson, head of the department of pediatrics, and Dr. Milton J. Raisbeck, associate professor of medicine.

#### University of California Charter Day Exercises

Students, faculty and alumni attended Charter Day exercises held in San Francisco, March 28-29, at the University of California Medical Center to celebrate the university's seventy-third birthday. The dean of Stanford University School of Medicine, Dr. Loren R. Chandler, spoke on "The Future of the Student and Recent Graduate." The celebration included clinics, demonstrations at the medical school, the annual meeting and the banquet of the medical alumni, at which Dr. Karl F. Meyer, professor of bacteriology, discussed "The Relationship of Public Health to National Defense."

#### Undergraduate Meeting at George Washington University

One day in the year is set aside for an undergraduate medical meeting at the George Washington University School of Medicine, Washington, D. C.; the second annual meeting of this kind was held at the medical school April 19. The morning of that day was devoted to the presentation of seventeen papers by students who have been engaged in research. In the afternoon the student body was addressed by Dr. Nicholson J. Eastman, professor of obstetrics, Johns Hopkins University School of Medicine, Baltimore, on "Asphyxia Neonatorum." In the evening the first annual medical ball was held at the Shoreham Hotel.

#### Medical History at Long Island

A group of students at Long Island College of Medicine, Brooklyn, have formed a medical history club under the tentative name of Donellan House Club. At the first meeting, February 26, among other subjects

presented was "Sammelweis and Puerperal Sepsis" and "Medicine in Old London." At the second meeting, April 17, Jean A. Curran, dean of the medical school, presented a paper entitled "An Unknown Genius of American Medicine" (John Shaw Billings).

#### New Yale Members of A. O. A.

The Yale chapter of Alpha Omega Alpha, medical honorary society, announced on May 15 the election of the following medical students to membership in the society: Gioacchino S. Parrella, New Haven; Irving Waltman, Hartford; James M. Bunea, Hartford; Allan V. N. Goodyer, Stamford; John R. Lincoln, West Hartford; Maurice Tulin, Hartford; Antonio J. Waring Jr., Savannah, Ga., and Irving N. Wolfson, New York. Dr. Arnold L. Gesell, director of the Clinic of Child Development of Yale University, was elected an honorary member. Following the banquet and initiation, which was held in the Yale Faculty Club, Rudolf Schoenheimer, associate professor of biochemistry at Columbia University, New York, gave the annual Alpha Omega Alpha lecture on "The State of the Structural Elements of Life."

#### Premedical Fraternity at Detroit

The national honorary premedical fraternity, Alpha Epsilon Delta, installed its thirty-second chapter at the University of Detroit, Michigan, March 8, 1941, when the Iota chapter of Omega Beta Pi became the Michigan Alpha chapter of Alpha Epsilon Delta with the induction into the fraternity of twenty students and two faculty members.

#### Woman's Medical College

The third and fourth year students of Woman's Medical College of Pennsylvania, Philadelphia, were addressed, January 2, by Dr. Bertha Van Hoosen, of Chicago, on "Surgery Made Plain." The lecture forum of the college presented a symposium on "Chronic Cumulative Lead Intoxication," February 14; the speakers were Dr. Helena E. Riggs and Messrs. Feodor Letonoff and John Reinhold.

#### The Marion Sims Society

The first of a series of annual lectures, sponsored by the Marion Sims Clinical Society of the Medical College of the State of South Carolina, was given at the college at Charleston, April 25, by Dr. James H. Gibbs of Columbia, S. C., whose subject was "Marion Sims, Physician and Man." Dr. Gibbs was introduced by Dr. Robert Wilson, dean of the medical college. The lecture was attended by the students, members of the faculty and other physicians of the community.

#### College of Medical Evangelists

Dr. Oswald S. Lowsley, New York, addressed the junior and senior classes at the College of Medical Evangelists, Los Angeles, February 12. On this occasion a moving picture on venereal diseases was shown. Dr. Emanuel Libman, New York, conducted a clinic for the junior and senior students, February 7, at which time two patients with Libman-Sachs' disease were presented.

#### Annual Nu Sigma Nu Lecture at Colorado

The third annual Nu Sigma Nu Lecture at the University of Colorado School of Medicine was given April 21 by Bradley M. Patten, Ph.D., head of the department of anatomy at the University of Michigan Medical School, Ann Arbor, on "Micro-Moving Pictures of the Early Development of the Cardiovascular System in Living Embryos." Dr. and Mrs. Patten and

several faculty members were dinner guests at the Nu Sigma Nu House before the lecture, and open house was held later in the evening.

#### Haggard Memorial Lecture at Vanderbilt

The Alpha Kappa Kappa fraternity at Vanderbilt University School of Medicine, Nashville, Tenn., has established an annual lectureship in memory of the late Dr. William D. Haggard, professor of surgery and clinical surgery at the school for many years before his death, Jan. 28, 1940. The first lecture was delivered on January 17 by Dr. Mont R. Reid, Christian R. Holmes professor of surgery at the University of Cincinnati College of Medicine, on "Experiences in Vascular Surgery."

#### "DO YOU KNOW"

Following are answers to the questions appearing on page 2550:

1. Alphonse Laveran (1845-1922) of Paris made this discovery, Nov. 6, 1880, while an army surgeon in Algeria. Dr. Laveran was awarded the Nobel prize in 1907.
2. Dr. Robert Seymour Bridges (1844-1930), the only physician to hold this position. Dr. Bridges studied at St. Bartholomew's Hospital, London, and held several hospital appointments in that city before withdrawing from the active practice of medicine at the age of 37. His last work, "The Testament of Beauty," was published in 1929.
3. Dr. John Brown (1810-1882) of Edinburgh, the pupil and later assistant of the famous Syme.
4. Sir James MacKenzie (1853-1925), a graduate of Edinburgh, first made simultaneous records of the arterial and venous pulses to elucidate the clinical condition of the heart. He practiced nearly thirty years in a small city, then went to London as consultant in 1907 and, according to Garrison, made his mark by his sincere, earnest attitude toward the sick and his sterling books on the pulse and heart disease, including angina pectoris. He retired from practice in 1918 and the next year started the Institute for Clinical Research at St. Andrews. Garrison considers Sir James one of the greatest modern bedside physicians; he attracted patients from all over the world. By a strange irony of fate, he died of angina pectoris, a disease of which at that time he probably knew more than any one else.
5. Leonardo Da Vinci (1452-1519), who was the first to describe hardening of the arteries. He originated the idea of studying anatomy for the purpose of improving art. His anatomic drawings made from actual dissections were so accurate that many of them could be used in textbooks of anatomy today. He was born in the village of Vinci, near Florence, Italy, and was placed in the studio at an early age, where he served many years as an apprentice of painting. His most famous portrait, Mona Lisa, was of the young wife of a rich old man, Francesco del Gioconda.
6. Fritz Schaudinn (1871-1906) in May 1905, while working with Erich Hoffmann. Schaudinn took his doctor's degree in zoology in Berlin in 1894 and in 1906 he became director of protozoology at the Institut für Schiffs- und Tropenhygiene at Hamburg. He was the son of an East Prussian innkeeper.

#### UNTIL SEPTEMBER

The Student Section will not be published during June, July and August. In the meantime, papers, news and other items for the autumn issues of this section may be submitted.

## Book Notices

## BOOK NOTICES

**Temperature: Its Measurement and Control in Science and Industry.** Papers Presented at a Symposium Held in New York City, November 1939, Under the Auspices of the American Institute of Physics with the Cooperation of National Bureau of Standards, National Research Council and Officers and Committees of American Ceramic Society et al. Cloth. Price, \$11. Pp. 1,362, with illustrations. New York: Reinhold Publishing Corporation, 1941.

This is an authoritative, well documented, extensive survey of the whole field of temperature. Of the twelve hundred and ninety-two pages of text, some two hundred and fifty are directly concerned with temperature and its regulation in man and in industry with quite complete discussions of theoretical points, as well as practical applications and new methods and apparatus. There are thirteen chapters, each made up of from six to fourteen papers by recognized authorities in the field, as well as an extensive appendix and an excellent bibliography up to November 1939, and there are also frequently included discussions of the paper by other authorities. The section on temperature in biology discusses such questions as the temperature limits of life, the development of homeothermy in animals, temperature factors in production and the normal and febrile temperature pattern of laboratory animals. The section on temperature and its regulation in man considers among other things the temperature sense, heat exchanges under normal and abnormal conditions, thermoregulatory mechanisms and their disturbance, standard operative temperatures and some of the earlier observations on reduced temperature therapy. The book as a whole is technical yet interesting reading. It should be an invaluable handbook for reference by any one interested in the subject of temperature, though the clinical implications and control of abnormal temperatures are not as fully dealt with as one might wish.

**A Yankee Doctor In Paradise.** By S. M. Lambert, M.D. Cloth. Price, \$3. Pp. 393, with portrait. Boston: Little, Brown & Company, 1941.

For twenty years Dr. S. M. Lambert was stationed in the South Seas working for the Rockefeller Foundation. To him particularly was assigned the control of hookworm. It became necessary that he determine the extent to which natives in all portions of the South Seas were infected with this parasite and also to apply the techniques that have been developed by scientists for the treatment of such infection. As a physician and sanitarian he did not limit himself exclusively to hookworm but became familiar with other conditions that are prevalent, including particularly leprosy, tropical sores and the venereal diseases. This book, however, is no dryas dust recapitulation of the epidemiology of the South Seas. It is more fascinating by far than any novels of the current season. It is devoted equally to the anthropology and to the ethnology of the native tribes. He relates with a sharp sense of humor innumerable incidents which add excitement to the life of a physician who serves among primitive peoples.

THE JOURNAL of Nov. 19, 1921 contained an article by Maurice C. Hall on the use of carbon tetrachloride in the removal of hookworm which was the answer to the problem of the control of hookworm, and the arrival of that issue in February 1922 in the South Sea Islands was the inspiration for the tremendous success which Dr. Lambert achieved in his work.

In this fascinating book is told the story of the 325 pound queen of Tonga. Here is revealed the development of pidgin English and the manner of its use in the promotion of modern health and hygiene. Here is the inside story of a health ambassador working with amazing success to preserve the lives of the Fijian race and attempting to bring to it the blessings of civilized man without the inevitable destruction that seems to be associated with the work of civilized man in the tropics. Here is a book which might well be read by every medical student to prove to him that the advancement of scientific medicine has not destroyed the inspiration and romance of medical service. No doubt, one of the most important of Dr. Lambert's

accomplishments was the establishing of a school for the teaching of natives, who will themselves endeavor to aid in the stamping out of the diseases which are destroying them. Today Dr. Lambert and his devoted wife have retired to a well earned rest in California, but for him and for every reader of his book Fiji becomes instantly alive and beckons.

**Physikalisch-diätetische Therapie nach klinischen Gesichtspunkten.** Von Dr. Hans-Georg Scholtz, dirigierender Arzt der Abteilung für physikalische Therapie am Städtischen Rudolf-Virchows-Krankenhaus, Berlin. Paper. Price, 15 marks. Pp. 303, with 93 illustrations. Leipzig: Georg Thieme, 1940.

This textbook is divided into two main sections. The first section deals with the technic of application, the physiologic effects of physical agents and the fundamentals and administration of therapeutic diets. In the second section the clinical application of physical and dietetic therapy is considered. The text is a peculiar hodgepodge of good and poor methods of treatment, hydrotherapy, colonic irrigation, thermotherapy, light therapy, electrotherapy, including galvanic and faradic therapy and the employment of high frequency currents, mechanotherapy, including massage and manipulation, and the technic of local blood letting and Bier's passive hyperemia. In the part on dietetics, the author includes a discussion of the principles of nutrition, stipulations for the administration of therapeutic diets and indications for their employment in various diseases.

The text is well illustrated, but here again there seems to be little discrimination between what is good and what is bad in the field of physical and dietetic therapy. Whereas there are excellent illustrations on corrective exercises and under-water gymnastics, on the other hand there are many illustrations of antiquated devices such as the Schnee bath, queer and bath and descriptions of such comparatively useless procedures as sand baths, all interspersed with excellent illustrations of the more modern methods of applying massage, heat, exercise and electrotherapy.

The part on dietetics seems to be subordinated to the section on physical therapy; it probably would have been best if this phase of the subject had been dealt with in a separate book. In the clinical section of the book the employment of physical agents and diets is considered in connection with the treatment of certain infections, circulatory, respiratory and rheumatic diseases, as well as in diseases of the gastrointestinal, genitourinary and nervous systems and disease of constitutional and metabolic origin. Although there is much of interest in this section, there is also the usual lack of discrimination concerning proper indications. The illustrations are numerous and good. There is an adequate subject index, but no bibliography or list of references is appended. The book is recommended to any one who is interested in this field of therapy and who is capable of discriminating between the suitable and unsuitable material presented in the text. It is not recommended for the beginner in this field of therapy.

**Treatment in General Practice: Surgery (Continued).** Volume IV. Articles Republished from the British Medical Journal. Cloth. Price, 16s. Pp. 562, with 143 illustrations. London: H. K. Lewis & Co., Ltd., 1940.

This volume is a satisfactory presentation of the treatment of many common surgical conditions encountered in peacetime practice, handled by the general practitioner. It is satisfactory because facts of practical importance are stressed in an authoritative way by adhering to well tested principles and, for the most part, to sound, accepted methods of treatment. None of the articles are long, controversial or concerned with obscure conditions. It is a tribute to the editing that there should be such uniformity in concise presentation of significant material on so many subjects by so many authors. Each chapter is introduced by sufficient description to make identification of the lesions possible, usually assisted by plain but adequate illustrations (although some of the photographic cuts are poor). This is important because not a few of the relatively common but disabling injuries with the treatment of which a general practitioner is frequently confronted (such, for example, as hand infections and injuries about the shoulder joint) are often not correctly diagnosed or properly treated.

The material covered includes common traumatic injuries of the extremities, chest and spine and their associated complications, frequently encountered disturbances of the genitourinary tract (urinary retention, phimosis, hydrocele), rectal lesions (hemorrhoids, prolapse, pruritus), common infections, simple amputations, the treatment of varicose veins and of the complications of varicose veins, and the prevention and treatment of bed sores and essential principles so far evolved in the use of the newer chemotherapeutic agents as applied to surgical disorders.

No effort has been made in any of the volumes of this series to deal specifically with the injuries of modern warfare. Much that the book says regarding trauma is applicable to the treatment of these conditions, but no special technics which apply to the handling of such injuries and no injuries peculiar to the present military situation are described. Any one interested primarily in the latter must look elsewhere, and for this reason the book may be undeservedly neglected. In spite of the unusual interest in military surgery at the moment, the book should be popular both in England and here: the points of view are essentially the same, the ground is well covered and the essence of each subject, because of the way it has been presented, is quickly and easily grasped.

**A Method of Anatomy: Descriptive and Deductive.** By J. C. Bolleau Grant, M.C., M.D., Ch.B., Professor of Anatomy in the University of Toronto. Second edition. Cloth. Price, \$6. Pp. 794, with 651 illustrations. Baltimore: William Wood & Company, 1940.

In the teaching of anatomy there is no substitute for actual dissection of the human body. However, anatomy books form an invaluable aid to the acquisition and retention of anatomic details. The various textbooks of anatomy have grown up traditionally with the development of the science of human anatomy and therefore represent careful analytic description and discussion revised again and again as they have been put to use and found wanting. The fact that anatomy is occupying less space in the student's curriculum necessitates a brief but thorough and more functional approach. That is the aim of this textbook. Its success can be appreciated only from experience. In many ways it should appeal to students who find existing textbooks replete with exhaustive and fatiguing detail. It resorts to simple uncolored drawings, usually schematic, which are easy to follow. It lacks the superb anatomic drawings of the better known anatomic works, and as a source of ready reference for review it cannot compare with the older style books. While it may prove of value in the teaching of anatomy, the student is less likely to treasure it and refer to it as he does the more exhaustive volumes. Students who use this book will be pleased by its refreshing attack on a difficult subject. Whether it can replace the well established, traditional textbooks is questionable.

**Health of White Settlers in Surinam.** By N. H. Swellengrebel, Professor of Parasitology, University of Amsterdam, Amsterdam, in collaboration with E. van der Kuyp, Government Physician Paramaribo. Colonial Institute at Amsterdam, Special Publication No. LIV. Department of Tropical Hygiene No. 16. Paper. Pp. 118, with 7 illustrations. Amsterdam: The Institute, 1940.

The International Refugee Colonization Society was founded in the Hague to finance the wholesale emigration of Jews and other refugees and to ascertain which countries would offer the best opportunities for settlement. From the first the organization was interested in Surinam in spite of its bad repute and the numerous failures at European colonization. Most of the work of the commission sent to Surinam was interrupted by the war, but the sanitary phases are preserved in this report.

The main portion of the report is divided into five sections as follows: general information, which includes a brief account of the climate, soil, population and governmental districts; sanitary conditions in Surinam, which summarizes and discusses the significance of the vital statistics of the area; sanitary history of the white settlement in Surinam; malaria in rural Surinam, and the prevention of diseases in a future settlement.

Professor Swellengrebel's scholarly and critical examination of the health conditions brings out some surprising conclusions. The health conditions on the coast of Surinam are

unbelievably good for a tropical area. They are exceptional in the tropical town of Paramaribo. In the rural areas malaria and hookworm lead all other diseases in importance, and the history of the attempts of white settlement in Surinam suggest that most failed because of malaria. In spite of these diseases, however, the average rural death rates are lower than in Paramaribo. The Bush Negroes are a serious reservoir of malignant tertian malaria for colonists, as they harbor large numbers of the parasite without marked inconvenience. In general, health conditions offer no obstacle to the settlement of Surinam with white persons provided the colonists avoid certain highly malarious areas (in particular the interior in or near the bush) and do not wantonly neglect certain elementary laws of health. Throughout his discussion the author, in common with certain other modern historians, warns against ascribing too great an importance to unfavorable health conditions as compared to economic factors in limiting colonization with white persons. The present volume is recommended as an exceptionally interesting and valuable contribution to tropical medicine.

**Anatomy and Physiology Laboratory Guide.** By Edmond J. Farris, Executive Director, Associate in Anatomy, The Wistar Institute of Anatomy and Biology, Philadelphia. Third edition. Paper. Price, \$1.60. Pp. 144, with 126 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1941.

While the reviewer is not familiar with earlier editions of this manual, it is obviously designed for a school of nursing. As such it appears to be admirably developed. According to the preface, some valuable improvements have been made. The general plan is one of integration of anatomy with physiology. For example, unit 1 is devoted to the body as an integrated whole, and in this is an introduction to anatomy together with some simpler physiologic experiments. Unit 2 deals with the erect and moving body and is similarly integrated. The illustrations include line diagrams, schematic diagrams, drawings and structures that the student must identify by labeling a roentgenogram of an erect human subject, colored schematic drawings of muscles, reproductions of simpler kymographic tracings and three full pages of photographs of laboratory equipment with sentence descriptions of each. There is also a table of more than forty teaching films, listed by unit, together with commercial distributors. This includes all the best sources of this type of teaching material. The manual contains a surprising amount of information for the purpose for which it is designed.

**Diagnosis and Treatment of Arthritis and Allied Disorders.** By H. M. Margolis, M.D., M.S., F.A.C.P., Chief, Arthritis Service, St. Margaret Memorial Hospital, Pittsburgh. Cloth. Price, \$7.50. Pp. 531, with 140 illustrations. New York & London: Paul B. Hoeber, Inc., 1941.

This book was written to indicate to the family physician the possibilities of preventing and treating arthritis and its allied disorders. The author emphasizes the purely clinical aspects of the treatment and simple office procedures. The introduction is well written. The illustrations of the constitutional basis on which atrophic arthritis is built, using the pyramid as an example, are instructive. The chapter on the pathologic changes is a little short. The author presents a fair and just account of the importance of focal infection in atrophic arthritis. In the illustration on head traction, the author has not shown the raising of the head of the bed. His discussions of the cervical rib and the scalenus anticus syndrome are well worth the time required to read them. One of the most valuable parts of the book is the author's fifteen section discussion of low back and sciatic pain. His choice of borrowed illustrations is good. The bibliography is up to date. On the whole this is a good book and is well worth reading.

**Allgemeine Elektrokardiographie.** Von Professor Dr. Eberhard Koch, Direktor des Physiologischen Universitäts-Institutes Gießen. Mit einem Anhang: Richtlinien für die Auswertung eines Ekg. Von Dr. Elisabeth Koch-Momm. Fifth edition. Paper. Price, 2.25 marks. Pp. 49, with 44 illustrations. Dresden & Leipzig: Theodor Steinkopff, 1940.

The new edition is a slight amplification and revision of the previous edition of this short monograph. It is useful in introducing the reader to the theoretical aspects of electrocardiography. It can be recommended to those seeking such information.

# QUERIES AND MINOR NOTES

## Queries and Minor Notes

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THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### CLIMATE AND ARTHRITIS

To the Editor:—Would you please advise us regarding arthritis in North and South Dakota? We are interested in the prevalence in North and South Dakota, as well as whether a patient is benefited or harmed by residence in that state. We understand the ambiguity of the latter statement but would appreciate any information you may give us along these lines.

Percy A. Ward, M.D.,  
John T. PETERS, M.D.,  
Minneapolis.

ANSWER.—There are available no comprehensive figures on the incidence of rheumatic diseases in North or South Dakota. The recent (1935-1936) National Health Survey gave the national incidence of arthritis and rheumatism but not the incidence by states. Perhaps unpublished data thereon could be obtained from the United States Public Health Service, which conducted the survey. The incidence of rheumatic disease is reportedly considerably greater in the Northern than in the Southern states. For example, rheumatic fever is several times more common about latitude 47 north, that of North Dakota, than it is in latitude 25 north, that of Florida (Seegal, David; Seegal, Emily B. C., and Jost, Elizabeth L.: A Comparative Study of the Geographic Distribution of Rheumatic Fever, *Am. J. M. Sc.* 190:383 [Sept.] 1935. Nichol, E. F.: Geographic Distribution of Rheumatic Fever and Rheumatic Heart Disease in the United States, *J. Lab. & Clin. Med.* 21:588 [March] 1936). For the size of their populations there is probably more chronic arthritis in the Dakotas than in the Southern states. The inquirer, however, is obviously concerned not with the possible appearance of arthritis among nonarthritic persons who move to the Dakotas but with the probable influence of the climate on an already existing arthritis. It is not stated what kind of "arthritis" the patient has. Gouty and osteoarthritis (hypertrophic) are affected by weather less notably than is rheumatoid arthritis. Patients who have the latter disease generally feel worse in cold weather and in winter, better in warm weather and in summer; they often can predict the approach of a storm by an alteration in their symptoms. But there are so many exceptions to these generalizations that the effect of climate and weather on arthritic patients has never been precisely defined.

Climate and weather are a composite of temperature, humidity, barometric pressure, atmospheric electricity and other factors. Rentschler, Vanzant and Rowntree (*Arthritic Pain in Relation to Changes in Weather*, *THE JOURNAL*, June 15, 1929, p. 1995) noted that barometric pressure influenced the symptoms of most arthritic patients more consistently than did temperature or humidity. But it did not influence all arthritic patients in the same way; some felt better when the barometer rose, others felt better when the barometer fell. Humidity has a definite part in determining an arthritic patient's symptoms. The arthritic feel better on cold dry days than on cold damp days; also they feel better on hot dry days than on hot humid days; they may feel worse even than in winter time (Coste, F., and Forestier, J.: *Rheumatic Meteoropathology*, *M. Press* 197:116 [Aug. 10] 1938). And despite the notable shifts in temperature which occur between the winter days and the nights in Arizona, arthritic patients generally feel better there because of the stability of the other factors that may affect them adversely.

A recent survey led Tegner (Treatment of the Rheumatic Diseases in the United States and the Continent of Europe, *Rheumat. Dis.* 1:249 [Oct.] 1939) to conclude that in the temperate zone local climate is a relatively unimportant factor in aggravating the symptoms of the disease, although it may be a more important factor in the tropics. Of greater importance than the general climate is "the microclimate" of the dwelling place (Hill, Leonard: *Rheumatism and Climate*, *Brit. M. J.* 2:276 [Aug. 5] 1939). According to Hill, damp, atmospheric electricity and cyclonic disturbances are important. Eskimos and Lapps have much less rheumatism in temperate zones who live indoors in badly insulated, artificially heated houses. Despite the cold, none of the arctic explorers had rheumatism.

The winters of the Dakotas are cold, but so are those of Minnesota, and it is probable that an arthritic person from Minneapolis would find no notable alteration in symptoms after moving to the Dakotas. Patients in these states would feel more comfortable were they able to avoid the rigors of the Northern winters. But to combat the latter much can be done in the way of warm, well ventilated houses, the use of warm but porous clothing, and the consistent daily use of various simple home methods of physical therapy supplemented by professional physical therapy and other remedies. Such is the nature of chronic rheumatoid arthritis that many a victim of that disease may be much better off in the Dakotas if he carries out a careful schedule of orthodox antiarthritic therapy than if he treks south to lie neglected in the sun without benefit of other treatments.

### EFFECTS OF ORALLY ADMINISTERED ALUMINUM ACETATE SOLUTION

To the Editor:—Is aluminum in the form of liquid aluminum acetate ingested orally absorbed into the general circulation? Or is practically 100 per cent of it eliminated by the bowel? If absorbed does it affect the circulation, glands or other soft tissues or the bone? Is there any contraindication for its ingestion orally rather than its slight astringent effect?

A. C. Howe, M.D., Brooklyn, New York.

ANSWER.—The soluble salts of aluminum, like those of other heavy metals precipitate proteins, are astringent and are only slightly absorbed if at all. Some of the early investigators reported that the soluble aluminum compounds are completely eliminated in the feces. Other investigators have shown that there is slow absorption of small quantities of aluminum compounds when taken orally. These small amounts are rapidly eliminated in the urine with no storage of aluminum in the tissues of the body. Symptoms of aluminum poisoning due to storage of aluminum in the tissues of the body do not occur when aluminum salts are given by mouth, even in large doses and over long periods. The metal is excreted in the feces partly as phosphate, thus deflecting the phosphates from the urine or preventing their absorption and utilization. Unless the income of phosphorus is deficient, this is practically unimportant. Rickets has been produced in animals by continued overdosage with aluminum salts. Because they are not readily absorbed, even large doses cause only local exudative inflammation of the alimentary canal. The astringency of aluminum compounds tends to produce mild to severe constipation which may be controlled by the administration of liquid petrolatum.

Solution of aluminum acetate (Burow's solution) of the National Formulary VI contains about 5 per cent of neutral aluminum acetate and, as it is prepared from lead acetate and aluminum sulfate, it may contain a small amount of lead as an impurity. Solution of aluminum subacetate of the National Formulary VI contains about 8 per cent of aluminum subacetate (equivalent to about 10 per cent of aluminum acetate) and is identical to the solution of aluminum acetate (Burow's solution) described in the British Pharmaceutical Codex, except that the latter contains approximately 17.8 per cent of aluminum subacetate (equivalent to approximately 22.5 per cent of aluminum acetate). Neither of the National Formulary preparations is recognized for internal use, and the solution of aluminum subacetate (N. F.) would be undesirable for such use because of the danger of poisoning from the lead impurity. It should be noted that while the synonym Burow's solution is applied in both instances to the names solution of aluminum acetate, these solutions are described differently in the National Formulary and the British Pharmaceutical Codex, only the former containing lead as an impurity. The similarity of the latter with that of the official subacetate solution is illustrated as follows:

Solution of Aluminum Subacetate (N. F.)		Solution of Aluminum Acetate (B. P. C.)	
Aluminum sulfate.....	160 Gm.	Aluminum sulfate.....	225 Gm.
Acetic acid.....	160 cc.	Acetic acid.....	250 cc.
Precipitated calcium carbonate.....	70 Gm.	Calcium carbonate.....	100 Gm.
Water, a sufficient quantity to make.....	1,000 cc.	Distilled water.....	750 cc.

Recently A. J. Helfet (A New Conception of Parathyroid Function and Its Clinical Application, *Brit. J. Surg.* 27:651 [April] 1940) has reported the use of a solution of aluminum acetate in the treatment of parathyroid diseases. Based on the theory that retention of phosphate acts as a stimulus to increased secretion of parathyroid and that this results in a "compensatory" hyperparathyroidism with essentially normal glands and blood calcium and phosphorus values, this investigator has proposed the oral use of aluminum acetate for the removal of phosphate from the body in the treatment of secondary hyperparathyroidism.



# QUERIES AND MINOR NOTES

JOUR. A. M. A.  
MAY 31, 1941

or generalized fibrocystic disease (not due to adenomatous parathyroid glands), rheumatoid arthritis and osteitis deformans (Paget's disease). The author indicates that decalcification of the skeleton (osteoporosis) and a negative calcium balance occur in these conditions and that this is suggestive of a hyperparathyroid state may be partially responsible for the latter conditions although no definite evidence exists to establish this point. In addition to a solution of aluminum acetate, 1 pint of milk is given daily as a source of calcium and vitamin D. The author gives a prescription which contains "Liq. aluminum acetate (B. P.)"  $1\frac{1}{4}$  ounces with a sufficient quantity of the vehicle (used to disguise the astringency of the drug) to make 4 ounces. The prescription calls for a minimum dose of 1 drachm four times daily after meals. The British Pharmacopoeia describes no solution of aluminum acetate. It is therefore assumed that the author's prescription refers to the solution of aluminum acetate (Burrow's solution) of the British Pharmaceutical Codex. On this basis it may be computed that the amount of aluminum acetate in the proposed prescription is approximately 7.2 per cent. The author states that the prescribed amount of aluminum acetate has a phosphate combining power to from 150 to 220 mg. of calcium. Under the author's discussion of rheumatoid arthritis, however, the average dose of aluminum acetate is stated to be 1 drachm of a 2.5 per cent solution four times a day. Apparently a weaker solution was employed for the cases of rheumatoid arthritis than for fibrocystic disease and osteitis deformans. The 15 cases of arthritis treated showed no significant change in the blood calcium and phosphorus or in the radiologic evidence, although clinical improvement occurred in all but 2. Some increase in bone density was observed in 2 of the 8 cases of Paget's disease treated and in all 4 of the cases of generalized fibrocystic disease.

Besides being too inadequate to establish definite conclusions, the evidence presented by the author appears questionable when it is realized that the daily intake of milk of most of the patients treated with aluminum acetate provides more phosphorus than can be expected to be removed by combination with the amount of the drug given. The author indicates that an attempt to find an adequate diet of a constant low phosphorus content was abandoned as impracticable. As has been indicated, unless the phosphorus income is deficient, the removal of phosphates by aluminum acetate is of no practical importance. Further studies appear to be necessary before the usefulness of aluminum acetate in secondary hyperparathyroid states and rheumatoid arthritis can be established.

## BENIGN TUMORS OF GALLBLADDER

To the Editor:—What is the prognosis of a small adenoma at about the ampulla within the gallbladder in a woman aged 34? The gallbladder fills and empties promptly. There has been vague distress at intervals for two years, and the roentgenogram suggests periduodenal adhesions. The appendix does not fill. The gastrointestinal tract is otherwise normal. There is never any jaundice. No change in size has taken place since the roentgen examination six months ago. The patient is in excellent health, and conservative treatment with roentgen rays once a year is considered unless statistics show the tendency to malignancy is too great.

D. G. Dudley, M.D., Endicott, N. Y.

ANSWER.—Benign tumors of the gallbladder, although apparently rare, have been sufficiently studied in surgical and necropsy specimens to indicate that two general types probably occur: 1. Those secondary to chronic proliferative cholecystitis. These are usually multiple. 2. Polyps and adenomas (adenomyoma, myoma, lipoma, myxoma and fibroma), usually occurring singly and regarded by Kerr and Lendrum (*Brit. J. Surg.* 23:615 [Jan.] 1936), in a review of the literature, as true tumors of the gallbladder in contradistinction to the first group.

The probability that such tumors may undergo malignant change seems to be small. Carcinoma of the gallbladder has been reported which appeared grossly like an adenoma (Lauritzen, S. H.: *Acta chir. Scandinav.* 79:105, 1936. Eiserth, P.: *Virchows Arch f. path. Anat.* 302:717, 1938). Presumably these tumors were not malignant from the onset. Eiserth found 13 adenomas, one of which showed microscopic evidence of malignancy, in approximately 4,000 gallbladders. These reports are chiefly concerned with stressing the possibility of malignant degeneration. On the basis of surgical and necropsy material it would appear that carcinoma may arise in papillomas or polyps of the gallbladder but that this has been observed in only a small proportion of the cases.

There is little, if any, evidence that polyps seen by cholecystography have undergone malignant change. Whether this indicates that polyps of gallbladders which concentrate dye sufficiently to visualize differ in their potentialities from clinically unrecognizable polyps is not known. It should be emphasized

that an insufficient number of cases have been studied by cholecystography and eventually followed to operation or necropsy to justify statistical conclusions.

In view of these considerations and the fact that the diagnosis of polyp of the gallbladder by a competent roentgenologist has at times not been confirmed at operation or necropsy, medical management would seem to be the treatment of choice. Indications which would justify operation are (1) symptoms definitely referable to the biliary tract which fail to respond to medical treatment or (2) an increase in the size of the filling defect in the gallbladder (Walters, Waltman, and Snell, A. M.: *Diseases of the Gall Bladder and Bile Ducts*, Philadelphia, W. B. Saunders Company, 1940, p. 471).

## ERUPTION OF TEETH

To the Editor:—A boy at the age of 4 fell and knocked out two teeth, the upper central and lateral incisors. A roentgenogram taken about a month later showed the permanent teeth well formed. This was four years ago, and these permanent teeth have not erupted. Several roentgenograms in the past year have shown the teeth well formed, and the dentist has been expecting them to grow out of the gum at any time for the past year. He is now a healthy, well developed boy of 8. He is about 2 inches taller than the average, and his weight is about average for his age. He was a bottle fed baby. He has had no serious illness except bronchopneumonia two years ago. His baby teeth were slow in developing. He has shed his remaining upper and lower incisors, and the permanent teeth have grown in normally. Any suggestions you can give to stimulate the growth of these teeth will be appreciated.

W. J. Graber, M.D., Beaumont, Texas.

ANSWER.—The eruption of the teeth appears to be related to periodontal vascularity. Vigorous rubbing, therefore, of the gingival tissue which overlies the unerupted teeth with the fingers and a tooth brush is likely to facilitate their eruption. If this procedure is not effective, it is possible that eruption has been delayed because of a mechanical obstruction of the overlying soft or even osseous structure, which normally should atrophy or become resorbed. The surgical removal of the overlying gum tissue or bone and the exposure of the incisal portions of the teeth are then indicated.

## SENSITIVITY TO FACE POWDER AND PERFUME

To the Editor:—A patient is sensitive to orris root. She has a vasomotor rhinitis but will not use any hypoallergic powder. She buys expensive powder from the department stores, and they assure her that the powder is free from orris root, lead and rice. A cutaneous test with her new powder is positive but not so strong as with orris root. Are there any chemicals related to orris root in the ordinary powders which will sustain the symptoms? She is receiving injections. Will it be necessary for her to use only hypoallergic powder?

Elk Tannenbaum, M.D., New York.

ANSWER.—The only possible allergenic substance which may be included in powders and which may sustain the allergic symptoms, in the absence of orris root and rice starch, is wheat starch. Few cosmetic manufacturers use any starch in their powders, and orris root is rarely used. The probabilities are that the patient may be sensitive to the perfume used, since the vast majority of persons sensitive to face powders are also allergic to the essential oils. Of course in rare instances some people may be sensitive to the individual components of a cosmetic which would ordinarily be considered nonallergenic.

## MUSHROOMS AND HYPERTENSION

To the Editor:—Can you advise me concerning the use of mushrooms in the treatment of high blood pressure? I know they have been of some use, but I'd like to know what references there are on studies in the use of this succulent food. I know parsley and garlic are used as well.

John Fassett Edwards, M.D., Easton, Pa.

ANSWER.—There is no scientifically valid evidence that mushrooms have any therapeutic value in hypertensive arterial disease.

## REDUCED SPERMATOZOAL FERTILITY

To the Editor:—May I take exception to the answer to the question headed "Few Motile Spermatozoa After Operation for Cryptorchism" in *Queries and Minor Notes* (April 12, 1941)? This stated that "at present there is no satisfactory method of inducing spermatogenesis." The man in question has a basal metabolic rate of minus 11, and a few motile spermatozoa were found in his specimen of spermatic fluid. The urologists of our sterility study group have been classifying in the relatively sterile, rather than absolutely sterile, group all men whose specimens show any spermatozoa at all, alive or dead. The reason for this is that some of these persons may be improved by proper treatment to fertility levels. The treatment consists of limited courses of stimulation by gentle prostatic massage, anterior pituitary-like sex hormone and obviously in this case thyroid substance, the latter over more prolonged periods. Vitamin E would seem also to be indicated. Our experience has been that the outlook for such a patient is by no means hopeless as far as spermatogenesis and children are concerned.

Paul Titus, M.D., Pittsburgh.



# The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 116, No. 23

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CHICAGO, ILLINOIS

JUNE 7, 1941

## CURRENT PROBLEMS OF AMERICAN MEDICINE

PRESIDENT'S ADDRESS

FRANK H. LAHEY, M.D.

BOSTON

Probably few presidents of the American Medical Association have been or will be inducted into the office in more uncertain or more urgent times. It is important, therefore, to inquire as to whether or not the American Medical Association has been fulfilling its obligations in these times. As I observe its activities and the results of these activities, it seems to me beyond any question that this query can be answered in the affirmative. At the very outset of these turbulent times the American Medical Association offered its services to the national government in the way of ascertaining the availability of doctors for service, and this offer was promptly accepted by the government. Facilities were promptly set up at the headquarters in Chicago to send out the necessary questionnaires; the necessary financial means, the office help and the mechanical facilities to handle the details of the questionnaires were provided, and the undertaking was immediately begun. Questionnaires were sent out to the latest known address of 186,303, and more than 150,000 have now been returned. Of this group about 146,000 have now been tabulated and put under the punch card system, so that they are available for immediate use for government needs. In addition to this, report forms have been sent through state medical society headquarters to all county medical societies to ascertain the availability of physicians for the care of those who are occupied in industry in the United States. These details are familiar to every one, but a nonboastful consciousness of a piece of work well done is the right of every individual or group. It would not be immodestly self approving for us as representatives of the American Medical Association to say that the undertaking of providing physicians for the care of our army, navy and industry would have been a much more difficult one, one requiring a much greater amount of time and one that would have been much less efficiently done were not the facilities, resources and records of the American Medical Association available and utilizable.

This is merely a single small example of the often unrecognized and unappreciated advantages resulting to this country from medicine having so efficiently organized itself.

President's address before the American Medical Association at the Ninety-Second Annual Session, Cleveland, June 3, 1941.

## PROVISION OF MEDICAL PERSONNEL

As the result of their experiences in the last war, doctors have been apprehensive lest the mistakes made in that war as relates to the Medical Corps would be repeated in this war. No one believes that it is possible in an undertaking of such magnitude as is the raising and training of such a large army and navy as we must have that mistakes will not be made in the Medical Corps and that some of the mistakes even of the last war will not be repeated. We all expect that this will be so and likewise we all expect to be tolerant concerning these mistakes, in view of the size of the undertaking. It is fair, however, to request that the major mistakes of the last war are not grossly repeated, that the value so far as possible of assigning men in the service to work with which they are familiar and for which they are trained is appreciated. It is but fair to ask likewise that the need for the continuing production of well trained doctors be not overlooked. For a period it seemed possible that this mistake might be made, but it now seems probable that those in whose hands the destiny of the country rests are becoming increasingly aware of the dangers of in any way interfering with the constant production of doctors. Not only would it be a short sighted policy to interrupt their education while in the medical school, but within reason it would be likewise short sighted to deny them at least some period of practical hospital training. Obviously it will not be possible in the present situation to provide as ideal a period of hospital training after graduation of medical students as can be obtained in less troubled times, and to meet these times a compromise between what is ideally desirable and what is practically feasible represents the need of the situation.

## DEFERMENT OF MEDICAL STUDENTS

We can well take a page from England's book regarding doctors and realize that not only are medical students not permitted to be drafted but they are not permitted to volunteer. The yearly production of doctors in this country amounts to about 5,000. Of the doctors practicing in this country about 3,800 for various reasons such as old age, sickness and death become unavailable for service, and the yearly demand for doctors in the various branches of the service amounts to about 3,500. No one has any idea how long it will be necessary to maintain such an army and navy as is contemplated, and it is therefore evident that the simple dictates of good sense indicate the necessity of the constant production of a supply of doctors. We should insist, therefore, not only that those who are in the course of their medical education should be maintained in it but also that those who are

definitely committed to the study of medicine and are in the premedical preparation period should be permitted to continue.

#### SELECTIVE SERVICE ACT

As a member of an appeal board which has now been functioning for several months, I have had the opportunity to be in close personal contact with the quality of the functioning of the Selective Service Act. As a result of this experience it is my opinion that it is being handled well, being honorably conducted, that men are being selected on a fair and just basis and that politics is having, at least as far as I have observed, practically no influence on the character of its activity. There are a few features concerning the Selective Service Act which need clarifying, however, in order that it may function more justly to all and be less dependent on individual interpretations of the act. These are particularly a greater stressing of the need of exempting trained mechanics and a more standardized policy as to the induction of married men. It is easy for a drafting board to assume that any one asking for exemption is seeking to avoid duty, with the result that men are being lost to war work who are urgently needed. These defects doubtless with further experience will be so clarified that this desirable end will be brought about.

It seems probable that as time goes on there will be greater and greater need for more help from the medical profession. There has been no group of men in periods such as these who have been more willing to serve than have the doctors. I feel sure that the demands to be made on us, which unavoidably and certainly must come in the ensuing months, will be met with satisfaction to our government and with credit to our profession.

A position also worked out by the English is worthy of our consideration and undoubtedly will eventually have at least to be thought of as a possibility—the development of a quota system as relates to the selection of American doctors. There has already been a greater number of medical volunteers from the South than from the North, and there will probably be areas where, as a result of greater volunteering, the number of doctors available for the community will be too limited. Should the present situation become even more urgent than it is, it is conceivable that many hardships may be worked in communities. An ideal arrangement in England has been worked out by means of the so-called quota system, by which committees select the number of men who are to go from different areas and suggest individuals for selection. These individuals are permitted as are draftees to make appeal, submitting their reasons, which are given serious consideration before the matter is settled. Obviously, the criticism of this is the question of its feasibility in a democracy such as ours. It may well, however, eventually prove necessary and should be in our minds at least as a possibility.

#### MEDICAL EDUCATION

I have always been interested in medical education, having spent a considerable portion of the first part of my life in undergraduate education and a definite portion of the latter part of my life in postgraduate education. Having been literally steeped in clinical medicine and surgery, I have at least a background of experience from which to develop some convictions regarding the subject.

It has always seemed to me that one of the greatest difficulties in medical education was to maintain a proper balance between the scientific side of medicine

and the practical side of medicine, the research aspect of medicine and the clinical aspect of medicine. It has always seemed to me important for every doctor to keep constantly before his mind the remembrance that the practical purpose of medicine is to care for the sick. As I have observed medical education particularly as it relates to surgery, since this is the field in which I am best qualified to judge, it has seemed to me that clinical surgeons are too apt to overvalue their clinical experience and technical skill and so unjustly depreciate professors of surgery doing a limited amount of actual surgery and a considerable amount of surgical teaching and experimental investigation. This can be and at times has been a real injustice. There are many teachers of surgery combining clinical and technical skill, investigative interest and training, and produce excellent young surgeons. There is, however, a certain amount of justice at times in this criticism, owing to the fact that medical schools often tend to place too many executive burdens on the heads of their department of surgery, to evaluate the quality of their professors of surgery too much in terms of their research products and to desire that their professors of surgery be excellent clinical surgeons but still turn over a large part of the clinical surgery to be done by residents in order to turn out the largest possible number of trained and experienced surgeons. As one who has spent his life busily occupied with clinical surgical problems and a large amount of actual personal operating, I am convinced that to teach surgery one must be busily occupied with the actual problems of surgery, that to be able to stimulate an interest and curiosity in surgery the teacher of surgery must be able to discuss the subject with his students not in terms solely of literature, theory or laboratory, although this is essential, but in terms of actual large personal experience. It has always seemed to me futile to assume the position that surgeons can be made by any other way than by surgery. With justice to both sides of the question, those who are daily occupied with the practical and technical sides of surgery must be careful lest their criticism of research surgeons does not constitute an apology for the lack of this quality in themselves. So, too, those who are busily occupied with undergraduate teaching and laboratory investigation must realize that their constant contact with relatively immature medical minds and their occupancy of an almost revered position in these as yet inexperienced minds does not cause them to acquire the habit of talking and thinking from above downward. If we could all remind ourselves several times each day that none of us in any branch of medicine are as great or as important as we think we are, and more important still than that, never as great as others sometimes think we are, it would be a fine thing.

#### ELEVATION OF MEDICAL STANDARDS

I am daily impressed with the fact that the standard of medicine is being constantly and satisfactorily elevated and I am more and more impressed with the fact that the best way to elevate medicine is to teach the people what good medicine is, on the one hand, and, on the other, to strive, as is constantly being done by the profession, to elevate medicine within itself. This will, in my opinion, accomplish more with less dislocation of what has already been accomplished in medicine than any other plan. While it is a little discouraging to see quacks flourishing and nostrum manufacturers prospering, one must remember that that has always been the privilege of the people through

generations. I have little faith that gullibility will ever completely cease to be a human failing. I have a definite conviction, however, that with legislative acts as to truthful advertising, that with the pure food and drug laws, that with the greater interest on the part of the public in reading sound articles on medicine and with greater effort on the part of medicine, in which the American Medical Association has played no small part, to raise the standards of medical education and the quality of hospital service, the standards of medicine in this country are being soundly and progressively elevated to a level which is not only gratifying to us but a credit to our country in the eyes of the world.

The activity of qualifying boards over the past and recent years promises with time to do something which has been urgently needed for a great many years, that is at least to exercise a quality, and possibly also in the course of time a quantity, control over specialization.

#### THE NURSING SITUATION

As I have observed the changes in medicine from time to time, I have been increasingly apprehensive concerning the nursing situation. I am highly conscious of the fact that criticisms of some of the present trends in nursing may meet with far from approving reactions on the part of the nursing profession. Since I speak as one in daily contact with the nursing problem at the bedside, in an executive capacity and in its specialized branches, I am at least qualified by experience to make some observations concerning it. I have been fearful for a number of years that the trend in nursing is away from service to the patient and too much in the direction of higher education. I have been fearful lest the higher and higher standards of requirements for entrance and graduation in nursing might not make it more and more difficult to obtain a sufficient number of nurses to meet our increasing demands. This is an apprehension which our present situation as relates to nurse shortage indicates as being more and more justifiable. What with the demands made on nursing at the present by army service, by public health, by industry and by other special branches in nursing, together with the relatively high cost of nursing for patients, it is necessary for nurses, physicians and legislators to have in mind at least the possibility of the employment of the practically trained nurse to meet the financial demands of the situation and the lack of personnel in the way of trained and registered nurses. It would be wrong for me with my interest in nurses and their future not to suggest to them that they take heed lest they educate and legislate themselves out of the important place they have held in medicine and in the community. It is really no exaggeration to say that, with many of the personal attentions to patients delegated to ward maids, the real art of nursing can be lost to the nursing profession.

#### ANESTHESIA

Having spent my life as I have in surgery, it is but natural that my observations should relate themselves to problems intimately connected with this branch of medicine, among which stands out most importantly that of anesthesia. I have been interested in the subject of anesthesia for a great many years. I have been interested in the training of anesthetists, I have been interested in elevating the standards of anesthesia, and I have had definite convictions that, by the training of good anesthetists and the elevation of the standards of anesthesia, operative procedures could be made more safe for patients, that fewer complications under

some of the newer forms of anesthesia would result and that operative procedures could be made infinitely more comfortable for patients under some of these newer forms of anesthesia. A greater and greater experience with these methods and the development of a larger and larger department of anesthesia in the clinic have convinced me more than ever of the soundness of these convictions. I have for a number of years mildly and gently reproached medical schools for their lack of interest in teaching and furthering the development of anesthesia. It has not been an easy task to accomplish the progress which, with the aid of a few enthusiastic pioneer anesthetists, has been obtained in this field, and there is still a large opportunity for greater progress in this department of medicine. There can be no doubt in the mind of any one who has had sufficient experience with the newer developments in anesthesia in the hands of those expert to employ them that they have made possible operative procedures hitherto deemed unfeasible, that they have lowered mortality rates and lowered morbidity. There is no doubt in my mind, as I wrote in a recent editorial on this subject, that the hospital which does not have anesthetists trained and experienced in all of the newer developments of anesthesia—endotracheal, ethylene, cyclopropane, regional, field block, pontocaine, nupercaine, continuous spinal anesthesia, intravenous pentothal, cervical block, paravertebral block and suction bronchoscopy—will not be in step with the times, that a hospital not having these facilities will not be able to show the low morbidity and mortality rates that a hospital possessing these facilities will be able to show. I am impressed with the fact that the frequent explanation of why such anesthetists are not employed in hospitals is that hospitals cannot afford them. It is my distinct conviction in many instances that this is due to the fact that many hospitals employ nurse anesthetists at relatively low salaries with a profit to the hospital. No reflection on nurse anesthetists is intended. Under the direction of trained physician anesthetists they can have a real place in the administration of inhalation anesthetics. To be sure, this profit is usually employed unselfishly in doing further charity work, and yet this is not rendering to the patient the best possible service for which he pays. While these remarks may seem a little critical, I am pleased to say that as I travel the country I see an ever increasing interest in this subject and an increasing number of hospitals which employ trained anesthetists and the advances in anesthesia.

#### POSTGRADUATE EDUCATION

One of the facts which has always impressed me about American medicine has been the thirst for knowledge on the part of physicians. As I travel the country from one end to the other, I am moved by the number of doctors who are willing to give up their practice, to travel limitless numbers of miles to acquire knowledge. As I see them in postgraduate meetings, often the same faces in the front rows, taking notes, listening attentively hour after hour, I am deeply impressed with the sincerity of their purpose, with the height of their ambition to improve themselves and with the zeal they display in accomplishing this. I doubt if there exists a group of men in the world who labor more diligently or more religiously or with greater constancy to improve their knowledge than do doctors. One has but to tabulate the number of postgraduate teaching courses going on in this country, the number of organized medical society meetings before which papers are read and the number of doctors who are in constant motion

in the way of visiting medical centers, medical schools and clinics to be convinced of the truth of this statement. The popularity of postgraduate teaching meetings is evidence of the fact that knowledge is being sought and these meetings are answering a real need.

There is an aspect, however, of this situation which needs consideration, and that is from the point of view of the talent available for this postgraduate teaching. Should the number of postgraduate seminars increase materially, it will be necessary either for these seminars to develop additional teaching talent or for some of the teachers at these seminars to arrange to eliminate their practice at home and to accept the fact that they are to become full time postgraduate teachers. It has always seemed possible to me as one busily occupied in postgraduate teaching that a better control in the way of spacing and planning postgraduate seminars could make them even more valuable to those physicians who wish to attend them and less burdensome to those teachers who are in the habit of occupying positions on their teaching staff. This suggestion is presented not as a personal complaint but as a suggestion whereby the quality of postgraduate teaching could be maintained and perhaps even improved.

#### WAR BETWEEN CAPITAL AND LABOR

It is impossible it seems to me in these times, and for any man with convictions, to make a presidential address without discussing in some degree world affairs. In the beginning of this address I stated that probably no President had been inducted into office in the American Medical Association in more uncertain or more urgent times. It is of interest perhaps in discussing our present situation in general terms to inquire why they are uncertain. They are unavoidably uncertain I believe as far as we are concerned because of world conditions. They are uncertain because we enter these conditions after a period of financial depression, after a period of economic experimentation which has been by no means successful in accomplishment, and this is said without criticism. No experiment can be certain of successful outcome before it is tried. They are uncertain because we have witnessed, perhaps unavoidably, a division of the country into bitter and hostile camps, both of which have been guilty of shameful exaggerations and untruths, if not premeditated misstatements about each other. Uncertain because labor and capital also are so irrevocably at odds with each other. Admitting the undeniable short-sightedness of capital while in the saddle, and no one who is honest can doubt it, there is little evidence that with labor in the saddle, as it is now, it is making any better job of it. Tolerance, forbearance, charity and moderation are apparently qualities not associated with those to whom is given the direction of large affairs. It appears equally lacking in capital and in labor, and one must have in mind the effect of such large authority and power on the minds of men as to their ability to think clearly, to project their minds clearly into the future in terms of possible distant effects, and to deal with situations justly and wisely without fear and without selfish interest.

#### SOCIAL GAINS AND PRESERVATION OF DEMOCRACY

What do we need in this present turbulent, uncertain situation more than anything else? Preeminently an understanding of the seriousness of the situation. There is nothing, it seems to me, more necessary and more lacking in the present situation than an appreciation of its seriousness. It is likewise apparently a human attribute to fail to face disagreeable facts—to make

them easier to live with by depreciating them or by not admitting their existence—and yet this has been one of the most expensive attributes to races and countries of recent times. In view of what I have for months insisted on, the real urgency of this situation is that we need outstandingly a dispersing of internal conflicts until the question of what is going to happen to the country is settled. Of what value is it to either side to win a victory in internal conflicts with the future of the country really uncertain, as I again insist it is? We should all make some generous gestures, and the higher places from which they are made the better will be the example and the better it will be followed. Let us all accept the taxes without question, let us support without complaint any increases that are necessary, let those of us who opposed the present administration accept and support it wholeheartedly and during this emergency withhold criticism of it except when we have constructive suggestions to make.

An immediate constructive suggestion, it seems to me, is real evidence that an effort is being made to reduce general expenses, not so that you and I can have less taxes but so that more money can be made available for defense expenditures. We ask for better evidences that reforms are to be set aside if only temporarily until the present emergency is over, better evidence that personalities with divergent opinions demonstrate better tolerance of their opposing points of view. We should all have a conviction concerning the war, but the nation should take a position very soon and, regardless of what we have said or thought, there must be national unanimity. If we are still in the stage of debate, let it be fair, free, unrestricted and without penalty. We must and at no late date, however, establish what is to be the policy of this nation as relates to the war situation. To my mind there is nothing and in the history of this country never has been anything which will influence the future of America more than the nature of this decision. When it is made, one of the most futile, stupid and unpatriotic things one could do would be to attempt to change that decision. Whether it is to be war or so-called all out support short of war, it is important to realize now before this decision is decisively made that there will then be only one kind of Americanism, that is the kind with 100 per cent support.

My own opinion, and I believe that it is my duty to express it, is that we are already committed to a position, whether we like it or not. I myself like it. We have dared the dictator. It is too late to appease him, and the word has no meaning in his language. We should arrive at a conviction concerning isolation. Is it right? It is my conviction that it is not. I prefer destruction if it need be to survival in covering terror. Give me positive commitment rather than compromising, unsatisfying safety. If I must face my friends in democracy trying to explain my reasons for seeking dubious safety and leaving them to their fate, I prefer the uncertainties of the hazardous undertaking frankly faced as hazardous, and to accept them. It is my opinion that if disaster should overtake us in this hazardous undertaking it would be no more terrible than what will happen to us if we are to try to isolate ourselves. We shall still have ourselves to live with. This nation has been gallant in the past and it can be gallant again. I do not believe that there is a safe course. In dangerous times such as these I would like to make as a closing statement that it is my conviction that a dangerous course has real advantages.

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THE FATE OF PATIENTS WITH  
UNTREATED BRONCHIECTASIS

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It is commonly assumed, in the absence of any real proof, that patients with a chronic productive cough and sputum that is free from tubercle bacilli are not seriously ill. Such patients are considered as having "chronic bronchitis," and often no real attempt is made to do much for them either diagnostically or in instituting therapeutic measures. These patients may be able to carry on routine activities throughout a greater part of the year but frequently are incapacitated for a longer or shorter period each winter. They have many episodes of acute infections of the respiratory tract usually diagnosed as pneumonia, pneumonitis or pleurisy. It usually is the acute phase of the disease that has concerned the physician. It is our purpose in this paper to present a follow-up study on 242 cases of bronchiectasis.

With the increasing use of surgical measures in the treatment of bronchiectasis, it is important to evaluate carefully the life expectancy of patients not receiving treatment. One may properly ask Is it justifiable to urge an operation of the magnitude of pulmonary lobectomy or lobectomies? What is the outlook of patients with bronchiectasis if surgical intervention is not instituted? Information concerning these questions should be available to the physician who treats patients with bronchiectasis. The mortality from the operation has been lowered to reasonable figures in skilled hands, approximately 10 per cent. For unilobar disease the mortality is under 5 per cent. Few reports bearing on the mortality from the disease itself and from its complications are available. The frequent fatal termination of bronchiectasis apparently is not well understood.

The cases of bronchiectasis included in this report have been diagnosed by roentgen ray studies and the employment of iodized oil or by bronchoscopy. The latter method of diagnosis may be open to some question. With a bronchoscope one can determine the condition of the bronchial mucosa and bronchial spurs and the presence or absence of pus—in other words, pulmonary suppuration. One may not be able to ascertain the exact cause of the suppuration; however, in expert hands the diagnosis by bronchoscopy can be relied on to a great extent. Iodized oil was first used for lung mapping in the Jefferson Medical College Hospital during 1925, and therefore this report includes cases diagnosed as bronchiectasis between 1925 and 1935, inclusive. The year 1935 was arbitrarily chosen because it was thought that after that date adequate time had not elapsed for accurate data to be available. Most reports on bronchiectasis include data up to the time of writing. It does not seem logical to include in a prognostic study of chronic disease cases that have only recently been diagnosed. No cases are included in which a foreign body was the etiologic agent. Bronchiectasis resulting from a previous pulmonary abscess or from tuberculosis also is excluded. Only those cases of bronchiectasis which presented no known etiologic agent are included.

A study of this character is of necessity incomplete because of the difficulty in making contact with patients

or their relatives. Many of them come from great distances. The method used was to send a comprehensive questionnaire to each patient. If no reply was obtained, a letter was sent to the referring physician, and if no information was obtained from these sources, the Retail Credit Company was employed to trace the patient. If evidence was found that the patient had died, the Bureau of Vital Statistics was asked to send a copy of the death certificate. Admittedly there are many inaccuracies, but in a general way the facts obtained are probably representative.

As previously stated, few reports are available on the fate of the patient with untreated bronchiectasis. There are many reasons for this. Few hospitals or clinic groups have an opportunity to see many patients with this disease. If there are no facilities to carry out appropriate studies or treatment the illness of many of these patients will not be diagnosed accurately. Bronchographic examination as a diagnostic aid has been employed only fifteen years. In many clinics its use is more recent. It commonly is not employed as a routine in diagnosis unless surgical treatment is contemplated. Frequent use of bronchoscopy as a diagnostic aid has been confined to a few medical centers until recently, and its routine employment in the study of cases of chronic cough still is not extensive.

TABLE 1.—Grouping of the Two Hundred and  
Forty-Two Patients

Living patients .....	112
Deaths from bronchiectasis or its complications.....	59
Deaths from causes not known.....	20
Patients receiving more or less regular bronchoscopic treatments elsewhere .....	20
Patients untreated .....	17
Patients who had lobectomies or thoracoplasties elsewhere.....	14
Total.....	242

A brief review of the literature on the prognosis of bronchiectasis reveals a wide variation of opinions. Jex-Blake<sup>1</sup> found bronchial obstruction present in 37 of his series of 105 patients coming to autopsy. Bronchopneumonia accounted for 31 per cent of deaths. He expressed the belief that the disease was probably rapidly fatal. Boyd<sup>2</sup> studied 56 cases during a ten year period; all the patients were children, and in most of them the onset occurred before the age of 2 years. Of these, 7 died, 4 of bronchopneumonia, 2 of miliary tuberculosis and 1 of nephrosis. Roles and Todd<sup>3</sup> had 106 patients with bronchiectasis proved by iodized oil and followed from three to six years. The total mortality regardless of type of treatment or with no treatment was 38 per cent. The mortality in medically treated patients was approximately 50 per cent, and among surgically treated patients it was approximately 30 per cent. Lebert<sup>4</sup> performed autopsies on 52 patients with bronchiectasis with the following notation: Twenty-one per cent had lived one year from the onset of symptoms, 7.7 per cent had lived two years, 30.7 per cent had lived three to five years, 15.5 per cent had lived six to ten years and 25 per cent had lived ten years from onset of symptoms.

In Warner's<sup>5</sup> series the average duration of the disease from the onset of symptoms was ten years.

1. Jex-Blake, A. J.: *Bronchiectasis*, Brit. M. J. 1: 591-594, 1920.
2. Boyd, Gladys: *Bronchiectasis in Children*, Canad. M. A. J. 25: 174-182, 1931.
3. Roles, F. C., and Todd, G. S.: *Bronchiectasis: Diagnosis and Prognosis in Relation to Treatment*, Brit. M. J. 2: 639-643, 1933.
4. Lebert, H.: *Klinik der Brustkrankheiten*, Tübingen, H. Laupp, 1873-1874, vols. 1 and 2.
5. Warner, W. P.: *Factors Causing Bronchiectasis*, J. A. M. A. 105: 1666-1670 (Nov. 23) 1935.



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Twenty-three per cent of the patients had died after an average of nine years from the onset. Findlay and Graham<sup>6</sup> observed 12 patients from onset up to twelve years, and of these 9 had died. They later studied a series of 32 patients and found the average duration

TABLE 2.—Living Patients

Total.....	112
Sex.....	52
Male.....	60
Female.....	23
Age on admission	33
Under 10 years.....	42
11 to 20 years.....	14
21 to 40 years.....	36
Over 40 years.....	18
Etiologic factors..	4
Pneumonia.....	10
Whooping cough.....	3
Scarlet fever.....	9
Measles.....	27
Empyema.....	2
Influenza.....	2
Undetermined.....	2
War gas.....	46
Immersion.....	26
Diphtheria.....	29
Duration prior to admission	10
Under 5 years.....	1
6 to 10 years.....	43
11 to 20 years.....	1
21 to 40 years.....	4
Over 40 years.....	22
Site of bronchiec-tasis	2
Bilateral.....	36
Right upper.....	2
Right middle.....	1
Right lower.....	1
Left upper.....	1
Left lower.....	1
Whole left.....	92
Whole right.....	20
Right middle and right lower.....	60
Diagnosis.....	62
By iodized oil.....	2
By bronchoscropy.....	3
Sinus disease.....	8
Present.....	11
Absent.....	31
Complications dur-ing the disease	
Otitis media.....	
Pneumonia.....	
Empyema.....	
Pleurisy.....	
Hemorrhage.....	

of life from inception of the disease to be two and sixty-three hundredths years. Raia<sup>7</sup> studied 33 children with bronchiectasis who had been admitted to the hospital between 1932 and 1938. Iodized oil was used in 30; the remaining 3 were too ill to have the injection given, and all 3 died. Raia expressed the belief that unless infection is controlled all types progress to the more severe, sacular form. He had 11 patients with this type: 4 patients remained unimproved, 2 died from the complications of bronchiectasis, 4 had a rapid downhill course necessitating surgical intervention and 1 had a thoracotomy for drainage.

In 1939 Selby<sup>8</sup> reviewed 120 cases of bronchiectasis in children in New South Wales. He traced 56 of 120 patients who had been admitted between the years 1918 and 1938. He included data on children who had not had studies done with iodized oil. It is impossible to arrive at any mortality figure from Selby's study because, of the 120 patients, 35 were living and were interrogated, 21 were dead and 64 were untraced. Since the Registrar General had no record of death among the 64 untraced patients, Selby expressed the belief that probably none of them had died. However, it does not seem accurate to include untraced patients in any follow-up study.

The largest series of cases of bronchiectasis in the literature was that of Perry and King.<sup>9</sup> Their report

6. Findlay, L., and Graham, S.: Bronchiectasis in Childhood: Its Symptomatology, Course and Cause, *Arch. Dis. Childhood* 2: 71-96, 1927.
7. Raia, A.: Bronchiectasis in Children, with Special Reference to Prevention and Early Diagnosis, *Am. J. Dis. Child.* 56: 852-882 (Oct.) 1938.
8. Selby, Cline: Review of One Hundred and Twenty Cases of Bronchiectasis in Children in New South Wales, *M. J. Australia* 26: 352-361, 1939.
9. Perry, K. M. A., and King, D. S.: Bronchiectasis, *Am. Rev. Tuberc.* 41: 531-547, 1940.

was based on 400 cases diagnosed by roentgenographic examination; the 400 patients were admitted to the Massachusetts General Hospital between the years 1926 and 1938, inclusive. One hundred and forty of these patients had undergone major surgical operations and were eliminated from this study. Of the 260 patients who did not have major operations 144, or 55 per cent, were known to be living in January 1939, 66, or 26 per cent, were known to be dead and 49, or 19 per cent, were not traced. If the untraced group is excluded, as it seems more accurate to do, then the mortality rate can be based on the traced patients alone. Of this group of 211 patients 66 are known to be dead, giving a mortality rate of 31 per cent.

Of the 144 living and traced patients, 127 continued to cough and 123 raised sputum; 33 had hemoptysis. Thirty-eight per cent were in excellent condition, 42 per cent in fair condition, 15 per cent in poor condition and 5 per cent in extremely poor condition. Forty-one per cent of those dead had died within five years of the onset of symptoms. (It should be remembered that this series includes cases diagnosed up to a period within a few months of writing.) Seventy-eight per cent of the dead died directly as a result of their disease. Only 6 of 114 patients who were checked after the

TABLE 3.—Deaths

Total.....	59
Sex.....	42
Male.....	17
Female.....	6
Age on admission	14
Under 10 years.....	24
11 to 20 years.....	15
21 to 40 years.....	25
Over 40 years.....	6
Etiologic factors..	4
Pneumonia.....	2
Whooping cough.....	5
Scarlet fever.....	17
Measles.....	21
Influenza.....	10
Undetermined.....	19
Duration prior to admission	6
Under 5 years.....	38
6 to 10 years.....	1
11 to 20 years.....	0
21 to 40 years.....	1
Over 40 years.....	4
Site of bronchiec-tasis	1
Bilateral.....	13
Right upper.....	0
Right middle.....	2
Right lower.....	45
Left upper.....	14
Left lower.....	26
Whole left.....	31
Whole right.....	2
Right middle and right lower.....	3
By iodized oil.....	1
By bronchoscropy.....	4
Diagnosis.....	11
Present.....	23
Absent.....	6
Sinus disease.....	2
Not known.....	3
Otitis media.....	1
Pneumonia.....	4
Empyema.....	3
Pleurisy.....	11
Hemorrhage.....	23
Cause of death....	6
Pneumonia.....	2
Pulmonary abscess and gangrene.....	2
Bronchiectasis complicated with pulmonary tu-berculosis.....	2
Asphyxia from pus.....	5
Septicemia.....	5
Abscess of brain.....	5
Bronchiectasis complicated with myocarditis.....	5
Extension of disease.....	2
Hemorrhage.....	13.5 years
Empyema.....	1.8 years
Average duration of life from onset of symptoms.....	
Average duration of life from date of diagnosis.....	

disease had been present from one to nineteen years showed any evidence of spread, and that was doubtful. Once bronchiectasis has been well established and proved by studies with iodized oil, does the bronchial system ever return to normal? This question has not been entirely settled, but many authors have reported the disappearance of symptoms and roentgenographic



evidence of bronchiectasis. Duken and von den Steinen<sup>10</sup> stated that in young children the lung has the ability to repair itself and the growth factor compensates for the destructive process by the development of new, healthy tissues. Erb,<sup>11</sup> in discussing the pathology of bronchiectasis, stated that the appearance of the bronchi in the early stages, before relining with epithelium takes place, is such as to suggest that healing at this stage with actual diminution in size may be promoted by bronchoscopic drainage. When once the bronchi become relined with epithelium, such healing is no longer possible.

After one has had the opportunity of examining many surgical or postmortem specimens taken from patients with bronchiectasis, one is at once impressed with the degree of dilatation of the bronchial lumens and the thickness of the bronchial walls along with advanced fibrosis of the intervening pulmonary parenchyma. That such extensive change ever returns to normal seems unlikely. It seems probable that in young children with early minimal involvement proper bronchial drainage may restore the lung to normal in a certain number of cases. We have seen patients who had demonstrable bronchiectasis at one time but in whom at the present time symptoms are lacking and studies with iodized oil give negative results; this, however, is unusual. Cookson and Mason<sup>12</sup> stated that there appeared to be no reliable statistics dealing with the expectation of life in cases of bronchiectasis in which conservative measures have been solely relied on.

Table 1 shows the grouping of the 242 patients studied. After the elimination of all the cases of bronchiectasis which may have been due to a pulmonic abscess or to the prolonged sojourn of a foreign body in a bronchus, those presented here represent as nearly as possible only cases of bronchiectasis with no positively identified etiologic agent. The etiologic factors tabulated represent merely the condition from the onset of which the patient dated his symptoms of bronchiectasis. Whether any of these conditions should be seriously considered as causative factors is debatable.

For the purpose of this study only data on the living patients who have not had regular bronchoscopic treatments and those not subjected to major surgical intervention are included along with the data on patients who have died from bronchiectasis or its complications. The total number of patients in these groups is 171; tables 2 and 3 give the salient features.

The tables are self explanatory and require little comment. It should be emphasized, however, that the illness of these 171 patients represents bronchiectasis without any known etiologic agent or factor, such as a foreign body or a pulmonary abscess. Since no patient is included who was admitted after December 1935, the diagnosis of disease of the lingula pulmonis is not mentioned. In the early days a diagnosis of bronchiectasis was sufficient, as no surgical intervention was contemplated. However, it is considered mandatory now completely to fill all the bronchial segments with iodized oil before undertaking surgical intervention, and therefore disease of the lingula pulmonis is frequently found. Disease of the sinus was determined by clinical study and roentgen examination or transillumination in every patient, with but 2 exceptions.

Hemorrhage is given as the most frequent complication during the course of the disease, and yet it is a rare cause of death, as may be seen in the tables. The term hemorrhage as used here means that the patient has had either hemoptysis or a frank hemorrhage. Of the 171 patients 67, or 39 per cent, dated the onset of their pulmonary disease from what was called pneumonia. There is little if any evidence to support the belief that bronchiectasis is caused by pneumococcus pneumonia. Other forms of pneumonia are perhaps less well understood, but evidence that they produce bronchiectasis is more likely in view of the changes produced in lung tissue. These patients probably were told that they had pneumonia by their physicians on the basis of fever, signs of consolidation or impaired resonance and rales, a condition probably better termed pneumonitis secondary to bronchiectasis. However that may be, we do not wish to leave the impression that we consider pneumonia as an important etiologic factor in the production of bronchiectasis.

#### CONCLUSIONS

1. One hundred and seventy-one patients with bronchiectasis admitted to the Jefferson Medical College Hospital between 1925 and 1935 have been studied.
2. Fifty-nine, or 34.5 per cent, are dead from bronchiectasis or its complications.
3. The average duration of life in the dead patients from the onset of symptoms was thirteen and one-half years.

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### PARAVERTEBRAL SYMPATHETIC BLOCK WITH ALCOHOL FOR THE RELIEF OF CARDIAC PAIN

REPORT OF FORTY-FIVE CASES

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There are certain persons who suffer so intensely from frequent paroxysms of cardiac pain that life becomes burdensome. They do not form a large group, but their plight is pitiable. Glyceryl trinitrate affords momentary relief, but they are not helped for any length of time by prolonged rest or by any of the usual medicinal remedies. In the preponderant majority, coronary sclerosis is at the basis of the trouble; a smaller number have aortic insufficiency resulting from either rheumatic fever or syphilis; to a few with no demonstrable anatomic lesions is applied, for want of a better term, the diagnosis "coronary spasm." In all these conditions the available evidence indicates that anoxemia of the heart muscle due to coronary insufficiency is the major factor concerned in causing the pain.

Various surgical procedures have been suggested and tried in the effort to bring relief. Among them may be mentioned cervical sympathectomy, section of the roots of the dorsal nerves, sympathetic ganglionectomy, cutting of the white rami communicantes, total thyroidectomy and the formation of a new supply of blood to the heart. The relative merits of these operations

10. Duken, J., and von den Steinen, R.: Das Krankheitsbild der Bronchiectasis im Kindesalter, *Ergebn. d. inn. Med. u. Kinderh.* 34: 457-566, 1928.

11. Erb, I. H.: Pathology of Bronchiectasis, *Arch. Path.* 15: 357-386 (March) 1933.

12. Cookson, H. A., and Mason, G. A.: Bronchiectasis a Fatal Disease, *Edinburgh M. J.* 45: 844-854, 1938.

Read in abstract before the American Clinical and Climatological Association, White Sulphur Springs, W. Va., Oct. 25, 1940.

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recently have been subjected to critical analysis<sup>1</sup> and will not be discussed here. In 1931 we reviewed the steps leading up to the development of paravertebral alcohol block by Swetlow,<sup>2</sup> collected all the cases reported up to that date and added 9 of our own.<sup>3</sup> At this time our experiences with 45 patients, including the 9 just mentioned, will be summarized, and the possible effects on the heart of interrupting painful sensations arising in it will be given brief consideration.

#### CLINICAL MATERIAL

Injections were made on 45 patients who suffered from severe, paroxysmal cardiac pain. Thirty-three were men; 12 were women. In 40, the diagnosis was coronary sclerosis; 3 had aortic insufficiency; 1 woman, whose discomfort was intense, showed no evidence of organic disease over a period of years, and her pain was classified as an instance of "coronary spasm;" 1 man, after seven years of observation, has come to be regarded as a malingerer. A summary including the ages of the patients is given in table 1.

The final analysis of results has been made on the basis of 40 cases. Four patients who died within a month and 1 lost to a follow-up examination have been excluded (table 1). Of these 4 dead, the first was a woman aged 65 with hypertension, who had suffered from a hemiplegic attack two years previously. She died of a cerebral hemorrhage on the day following injection. The second was a man aged 60, whose parox-

TABLE 1.—*Clinical Material: Forty-Five Patients with Cardiac Pain*

Sex		
Men	.....	33
Women	.....	12
Coronary sclerosis (aged 35 to 69 years; average 55 years)	.....	40
Aortic insufficiency	.....	3
Syphilitic (aged 44 and 32 years)	.....	2
Rheumatic (aged 25 years)	.....	1
"Coronary spasm" (aged 48 years)	.....	1
Malingerer (aged 48 years)	.....	1
Excluded from Analysis of Results of Injection		
Patients dying within one month	.....	4
Coronary occlusion	.....	2
Cerebral hemorrhage	.....	1
Granulocytopenic angina	.....	1
Lost to follow-up	.....	1

ysms were unusually severe and frequent and who died of coronary occlusion on the third day after operation. The third was a woman aged 55, who died on the eleventh day after injection. Necropsy revealed a recent thrombus in the anterior descending branch of the left coronary artery, with fresh infarction of the left ventricle. The fourth was a woman aged 67 who died of granulocytopenic angina which first became manifest thirteen days after injection. The leukocyte count on the day before operation was 9,900; on the day before death it was 800 per cubic millimeter. It seems unlikely that these terminal episodes resulted from the operative procedure.

Of the 40 patients followed, 10 were highly nervous persons who tended to exaggerate their symptoms. All of them showed unmistakable signs of heart disease. Whereas in a few the result was difficult to appraise with any reasonable degree of accuracy, relief, when

obtained, assumed added significance. When there was doubt as to the outcome, an attempt was made to underestimate the possible benefit derived.

#### POINTS IN TECHNIC

In general, the same technic has been used in all the cases. The needles were inserted in the upper five or, occasionally, six intercostal spaces, as described by White,<sup>4</sup> and tests were made to be sure that the points were not in the pleural cavity, in blood vessels or in the subarachnoid space. Markers were used to measure the depth to which the needles were inserted, and when the point of each needle reached the lateral aspect of the vertebra or the head of the corresponding rib it was assumed that the correct depth had been attained. In every instance the injection of alcohol was preceded by the introduction of 5 cc. of a 1 per cent solution of procaine hydrochloride. The preliminary injection of procaine hydrochloride prevents the pain which would otherwise be caused by the irritative effects of alcohol. Five cc. of an 80 per cent solution of alcohol was injected through each space in almost all our patients. In a few 6 cc. was used. In 1 patient 10 cc. was injected through each of the upper seven spaces; this caused more than the usual amount of postoperative discomfort. After the injection of procaine hydrochloride the patients were examined for signs of sympathetic and intercostal nerve block. Whether or not these signs were evident, the alcohol was injected unless there had been some difficulty in inserting the needles. This was done because it was found that the immediate appearance of a satisfactory effect of procaine hydrochloride was not essential to a successful result. Sometimes, signs which could not be satisfactorily demonstrated immediately after the procaine hydrochloride was injected were easily recognized the next day. Furthermore, many patients, because of temperament, difficulty with language, drowsiness or ignorance, were unable to aid in the mapping of areas of anesthesia. Some of them would never have consented to another attempt, and few could have cooperated any better the second time.

In the beginning it was our practice to perform all injections with the patient on the operating table. The patients were transported to and from the operating room by stretcher and were put back to bed immediately after the injection. More recently, in accordance with White's suggestion, this practice was discontinued. Each patient was given the injection in his own bed and required to lie quietly for at least one hour after injection. According to White, this is important to prevent diffusion of the alcohol and irritation of outlying nerves. So far, our experience does not seem to show that the results are any better in the patients treated in this manner. One important advantage of the operating table is that it can be raised or lowered to suit the operator's convenience.

#### RESULTS<sup>5</sup>

The variability of the clinical course in patients with coronary sclerosis is well known. In many, spontaneous improvement occurs over a period of time, presumably as the result of the development of a collateral circulation; in others symptoms increase as the disease

1. Ochsner, A., and DeBakey, M.: *The Surgical Treatment of Coronary Disease*, Surgery 2: 428 (July) 1937.

2. Swetlow, G. I.: *Paravertebral Alcohol Block in Cardiac Pain*, Am. Heart J. 1: 393 (April) 1926.

3. Levy, R. L., and Moore, R. L.: *Paravertebral Injections of Alcohol for the Relief of Cardiac Pain: A Review of Experience to Date and a Report of Nine Cases*, Arch. Int. Med. 48: 146 (July) 1931.

4. White, J. C.: *Paravertebral Injections of Alcohol, Ganglionectomy and Posterior Rhizotomy for the Relief of Cardiac Pain*, in Levy, R. L.: *Diseases of the Coronary Arteries and Cardiac Pain*, New York, Macmillan Company, 1936, chapter 13, p. 363.

5. The material was subjected to detailed statistical analysis with the help of Miss Dorothy Kurtz, supervisor of the record department of the Presbyterian Hospital.

progresses. All our patients were under observation for a sufficient length of time to indicate that they were getting worse rather than better. When improvement occurred it appeared in direct relationship to alcohol block.

Of the 40 patients 77.5 per cent (31) experienced varying degrees of improvement; no relief was obtained in 22.5 per cent (9). In 47.5 per cent (19) improve-

TABLE 2.—*Result of Alcohol Block in Forty Cases (Each Figure Is the Percentage of the Total Number)*

Relief.....	77.5
Permanent.....	47.5
Marked.....	40.0
Moderate.....	5.0
Slight.....	2.5
Temporary.....	30.0
Marked.....	15.0
Moderate.....	15.0
Slight.....	0
No relief.....	22.5
Duration of Follow-Up in Cases of Permanent Relief	
Nine years.....	2
Six to seven years.....	6
Two to five years.....	3
One year or less.....	8

ment was permanent to the time of the last follow-up examination. In 40 per cent (16) relief was marked, in 5 per cent (2) it was moderate and in 2.5 per cent (1) it was slight. Temporary relief was obtained in 30 per cent (12). This was marked in 15 per cent (6) and moderate in 15 per cent (6) (table 2). By marked improvement is meant 75 to 95 per cent relief, by moderate improvement 50 to 75 per cent relief, and by slight improvement 25 to 50 per cent relief.

Of the patients with permanent relief, 2 were followed for nine years, 6 for from six to seven years, 3 for from two to five years and 8 for one year or less (table 2). Of the 12 patients with temporary relief, the pain always recurred in a year or less: in 3 in less than one month, in 2 in from one to five months, in 2 in from six to eleven months and in 5 in one year.

In 18 cases relief was immediate, in 5 it was delayed less than one month, in 2 it occurred at the end of a month and in 1 at the end of two months.

Neither the duration of symptoms nor a previous history of coronary occlusion nor the degree of incapacity prior to injection appeared to influence the outcome. Ten patients in whom relief was marked and permanent had had pain for more than two years; of these, 6 had had symptoms for five years or more.

The electrocardiogram prior to injection was fixed in 16 cases and changing in 14; in 10 cases only one record was taken. That the form of the electrocardiogram was undergoing modification presumably indicated altering conditions in the coronary circulation. In these two groups improvement occurred with equal frequency. After injection the electrocardiogram remained unchanged in 12, improved in 7 and became worse in 10; in 11 cases only one record was taken. In every instance in which the electrocardiogram improved, relief was obtained. However, relief was observed also in patients in whom there was no change in the form of the records or whose records indicated advancing lesions.

After injection, Horner's syndrome appeared in only 9 patients, of whom 6 obtained relief. It was absent in 31 patients, of whom 25 obtained relief. It is clear that the occurrence of Horner's syndrome was not essential to a successful result.

Many of those who were relieved were able to go to work, either resuming their former occupation, working part time or at a less strenuous job than before. For all the patients who obtained permanent relief the amount of glyceryl trinitrate required was materially reduced; for 5 of these none was required.

Ten patients were dead at the time this material was assembled (table 3). Seven of them died of coronary occlusion at varying intervals following injection. In 1 case the cause of death was not known; in 1 case of rheumatic aortic insufficiency, death occurred from congestive heart failure; in a third, an operation for intestinal obstruction was followed by gangrenous peritonitis. It is at once apparent that coronary occlusion was the most frequent cause of the ultimate fatal outcome, as might have been anticipated.

There is a noticeable difference in the results in the private patients and those in wards. Of 9 private patients, all obtained relief; 6 of them obtained marked permanent relief. Of 30 ward patients, 22 obtained relief; 10 obtained marked permanent relief. As a group, the private patients were less inclined to be psychoneurotic; perhaps their social status eliminated the factor of economic worry. Their better intelligence made it easier to appreciate the degree of their discomfort as well as the extent of their relief.

In 2 cases a second injection was done. One patient was markedly improved for about a year after the first injection and then begged for a repetition of the procedure. She obtained almost complete relief after a second injection on the same side. Another patient was given a second injection after an interval of three weeks because the first was without result. He obtained no relief, and there was some question, in spite of unmistakable clinical evidence of coronary sclerosis, as to whether he was addicted to morphine.

In only 2 patients did the pain radiate solely to the right. In both of these, injection was done on the right side with a good result in 1 and a fair one in the other. In 18 cases there was radiation to both sides but predominantly to the left. Injections were made into the left side, with the result comparable to that obtained

TABLE 3.—*Data on Ten Patients Who Died More Than One Month After Injection*

Degree of Relief	Time Between Injection and Death	Cause of Death
Marked permanent.....	6½ years	Coronary occlusion
Marked temporary.....	6 years	Coronary occlusion
None.....	4 years	Not known
Marked permanent.....	4 years	Coronary occlusion
Marked temporary.....	2½ years	Coronary occlusion
Moderate permanent.....	1½ years	Coronary occlusion
Marked temporary.....	1½ years	Congestive failure *
None.....	1 year	Intestinal obstruction; gangrenous peritonitis
Marked permanent.....	6 months	Coronary occlusion
Moderate temporary.....	5 weeks	Coronary occlusion

\* Had rheumatic aortic insufficiency; aged 25 years.

when radiation was on one side only. After relief of pain on the left side there was never a shift of discomfort to the opposite half of the chest.

#### UNTOWARD EFFECTS

In 38 patients, painful alcoholic neuritis of the intercostal nerves was observed after the injection. This was severe in only 3 instances. In 14 cases it lasted less than a month and in 12 for about two months. In 12 cases it persisted for three months or more. Eventually it always disappeared; and, whereas it was a cause of complaint, the relief of cardiac pain, when

obtained, more than compensated for discomfort. The neuritis was accompanied by partial temporary anesthesia or hypesthesia of the wall of the chest. In 5 cases a small pleural effusion developed which was always absorbed within a week; aspiration was never necessary. One patient complained of pleuritic pain. Pneumothorax, reported by others,<sup>6</sup> was not observed. After injection, increased temperatures occurred in 25 patients and ranged from 99 to 104 F. Fever never lasted more than four days unless complicated by pleural effusion.

## COMMENT

It is apparent that in a high percentage of cases paravertebral alcohol block afforded relief from pain. There was no immediate operative mortality. Our results are similar to those of White,<sup>6a</sup> though the percentage of successes is not quite as large. He failed in only 9.5 per cent of 62 reported cases; the result was good in 52 per cent and fair in 30.5 per cent; in 8 per cent death occurred within two weeks of injection.

Several observations deserve comment. In not 1 of our patients was relief complete. Even in those in whom a result was obtained which was satisfactory to the patient some form of discomfort persisted. If the patient's tolerance for physical activity was exceeded or if he became emotionally upset, there appeared either actual twinges of pain, of less intensity than before injection, or a sense of pressure beneath the sternum. Some of the patients described this as a feeling of congestion in the chest. In several, mild dyspnea or a sinking sensation in the epigastrium was substituted for pain. That there should be some persistence of a danger signal is perhaps desirable, for the patient is warned when he has overtaxed his coronary reserve.

The question as to why relief should always be partial and in varying degree is not easy to answer. It is conceivable that the sympathetic ganglions and their rami communicantes are not completely destroyed. Should some of these again become capable of functioning, through a process of repair, a return of pain might be anticipated and, indeed, did occur in some instances. That relief should occur immediately is due to the prompt action of the alcohol on the nervous tissues. In those cases in which relief was delayed, perhaps degeneration took place more slowly. Failure to afford relief may be due either to faulty technic in injection, as a result of which the ganglions and rami are not adequately infiltrated, or to the conduction of pain by accessory pathways, some of which, as yet, are not known. It was striking to observe that even those patients who had obtained marked relief for varying periods and then suffered from an attack of coronary occlusion experienced intense pain at the time of the closure of the coronary vessel. This was invariably so, and the pain was referred chiefly to the area of the original discomfort. If the nervous pathways were completely interrupted, the attack should be painless; to assume that there are differences in the intensity of the impulses themselves does not furnish a wholly satisfactory answer. In this connection it is worthy of note that in the dog, in order to permit of painless ligation of a coronary branch, sympathetic denervation

of the heart on both sides is necessary;<sup>7</sup> and even under these conditions, pain occasionally is felt.<sup>8</sup>

In an earlier paper we<sup>3</sup> pointed out that the appearance of Horner's syndrome was not essential for obtaining a good result. This observation has been amply substantiated in this larger series of cases, for the syndrome appeared in a comparatively small number of those who experienced the most marked relief. According to current knowledge, afferent fibers carrying painful impulses from the heart reach the central nervous system by way of the first five thoracic ganglions, rami communicantes and dorsal roots.<sup>7</sup> If this path is interrupted there should be no perception of painful stimuli having their origin in the heart or its blood vessels, and the destruction of the stellate ganglion, which causes the appearance of Horner's syndrome, should not be required.

It is tempting to speculate as to the possible effect of abolishing pain on the coronary circulation and on the heart itself. Recently the experimental work of Manning, McEachern and Hall<sup>9</sup> has thrown interesting light on this matter. They first showed that the mortality following sudden occlusion of the anterior descending branch of the left coronary artery, in the anesthetized dog, is less than 10 per cent, whereas in the conscious dog it is about 40 per cent. Sudden occlusion of the left circumflex branch, under anesthesia, resulted in a mortality of 25 per cent, whereas in the conscious animal it was 75 per cent. The animals which died all showed ventricular extrasystoles, tachycardia and terminal ventricular fibrillation. It was concluded that the great increase in mortality for the conscious animal might be due to a reflex spasm of collateral arterioles and small arteries, producing additional areas of ischemia.

In a second paper these authors<sup>8</sup> observed in dogs that, when the stellate and upper five thoracic ganglions had been removed on the left side, ligation of the left circumflex branch in the conscious state resulted in a mortality of 33 per cent and ventricular fibrillation did not occur in any of the animals. When this same branch was ligated after bilateral sympathetic denervation of the heart, the mortality rate was 9 per cent. When the left anterior descending branch was ligated after sympathetic denervation on both sides the mortality was zero. Extrasystoles were infrequent, and ventricular fibrillation was not seen. These experiments were regarded as furnishing additional evidence that, by preventing afferent impulses from reaching the vasoconstrictor center, reflex spasm of collateral coronary arteries is prevented. It was suggested also that sympathetic denervation may render the myocardium less susceptible to the onset of ventricular fibrillation. Perhaps both mechanisms are concerned.

Clinical observations parallel those made in the laboratory. Of 376 patients who died of coronary sclerosis and thrombosis and were examined post mortem at the Presbyterian Hospital, 14 per cent died suddenly.<sup>10</sup> In the group with pain death was sudden in 27.5 per cent, and in the group without pain in only 9.1 per cent.

7. White, J. C.: Nervous Pathways Concerned in the Mechanism of Cardiac Pain, in Levy, R. L.: Diseases of the Coronary Arteries and Cardiac Pain. New York, Macmillan Company, 1936, chapter 5, p. 149.

8. McEachern, C. G.; Manning, G. W., and Hall, G. E.: Sudden Occlusion of Coronary Arteries Following Removal of Cardiosensory Pathways: An Experimental Study, Arch. Int. Med. 65: 661 (April) 1940.

9. Manning, G. W.; McEachern, C. G., and Hall, G. E.: Reflex Coronary Artery Spasm Following Sudden Occlusion of Other Coronary Branches, Arch. Int. Med. 64: 661 (Oct.) 1939.

10. Levy, R. L., and Bruenn, H. G.: Acute, Fatal Coronary Insufficiency, J. A. M. A. 106: 1080 (March 28) 1936.

6. Grant, F. C.: Relief of Pain in Angina Pectoris by Paravertebral Sympathetic Block with Alcohol, in Stroud, W. D.: Diagnosis and Treatment of Cardiovascular Disease, Philadelphia, F. A. Davis Company, 1940, vol. 2, chapter 38, p. 1185. White.<sup>4</sup>

6a. White, J. C.: Technic of Paravertebral Alcohol Injections: Methods and Safeguards in Its Use in the Treatment of Angina Pectoris, Surg., Gynec. & Obst. 71: 334 (Sept.) 1940.

Regardless of the character and extent of the coronary lesions, the presence of pain tripled the incidence of sudden death.

Two cases are briefly presented to show the course of patients who obtained marked permanent relief and also to illustrate the changes in the form of the electrocardiogram which were observed after alcohol block:

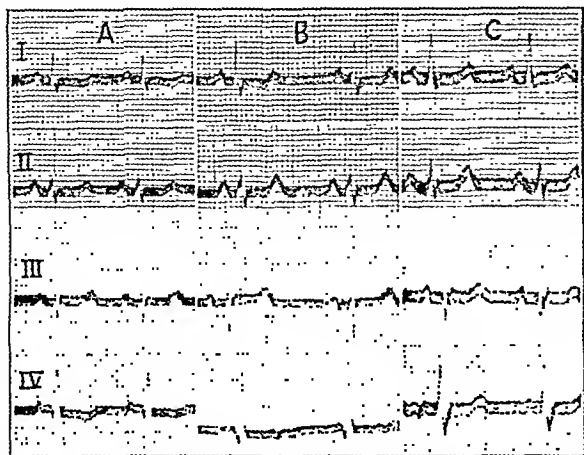


Fig. 1 (case 1).—Electrocardiograms of a woman aged 45 who has obtained marked permanent relief for more than six and one-half years. She is still living. The precordial lead in A and B was taken according to the old technic, with which the T wave in lead 4 is normally inverted; in C, it was taken with the newer technic and corresponds to lead 4 F. A, Jan. 16, 1934. (A record taken two weeks earlier was identical.) On January 18, paravertebral block was done. B, March 3 (six weeks after injection). C, Sept. 9, 1940.

#### REPORT OF CASES

**CASE 1.**—J. T., a housewife, aged 45, first came to the hospital in October 1933 complaining of attacks of precordial pain for thirteen weeks. These had been so severe and frequent that she had been unable to do her housework. Save for mastectomy for chronic cystic mastitis, she had always been well prior to the present illness. The pain radiated to the left arm and to the left side of the jaw. There was no dyspnea. Glyceryl trinitrate afforded relief.

Examination showed slight enlargement of the left side of the heart. The sounds were distant. No gallop was heard. The blood pressure was 100 systolic and 60 diastolic. The electrocardiogram showed sinus rhythm, with low voltage; the T wave was inverted in lead 1. The Wassermann reaction of the blood was negative. The blood cell count was normal.

From Oct. 31, 1933 to Jan. 18, 1934 the patient was in the hospital in bed. There were frequent and severe attacks of pain, requiring as many as nineteen tablets of glyceryl trinitrate in twenty-four hours. Discomfort increased in severity, in spite of rest during this period, and the electrocardiogram showed changes in form which at no time indicated infarction. The T wave in lead 1 was, on occasion, deeper, and the T wave in lead 2 was inverted. Records made on January 2 and January 16, however, were identical (fig. 1 A).

On Jan. 18, 1934 paravertebral alcohol injection was done through the upper six thoracic interspaces of the left side. Horner's syndrome was noted on the following day. There was mild intercostal neuritis, which lasted for two months. Relief of paroxysms of cardiac pain was immediate, though not complete. The number of glyceryl trinitrate tablets taken during the next few weeks ranged from one to five. By February 4, none were required. An electrocardiogram taken six weeks after injection showed an upright T wave in lead 1, a T wave in leads 2 and 3 of greater amplitude and an increase in the voltage of the QRS complexes (fig. 1 B).

This patient has been followed at regular intervals for the past six years and nine months. There has been progressive improvement. On Oct. 1, 1940 she was averaging less than one glyceryl trinitrate tablet daily and this only on making some

unusual effort. There was no actual pain but only a choking sensation. She was doing her own housework. The blood pressure was 128 systolic and 65 diastolic. The electrocardiogram was normal (fig. 1 C).

**CASE 2.**—A. L. S., a man, aged 58, an architect, was referred in January 1930 by Dr. A. B. Morrill, of Bronxville, N. Y. He had been well up to five years previously, when paroxysms of substernal pain first appeared after effort. The attacks became so much more frequent and intense that in July 1929, about seven months before he was seen by us, he was put to bed for a long rest. Since then he had been out of business, at home most of the time and going downstairs only occasionally.

Examination showed no cardiac enlargement. The sounds were distant, but no gallop was heard. There was a short systolic blow at the apex. The blood pressure was 136 systolic and 74 diastolic. The electrocardiogram showed a diphasic T wave in lead 2 and inversion of the T wave in lead 3 (fig. 2 A).

On March 7 he was admitted to the Presbyterian Hospital. There a duodenal ulcer was discovered by roentgen examination and he was given a Sippy regimen. The attacks of cardiac pain continued and were caused by such slight exertions as shaving or even turning in bed. These pains were relieved by glyceryl trinitrate.

On March 19 paravertebral alcohol injection was made through the first five left dorsal interspaces. Horner's syndrome did not develop. There was some immediate partial relief. The electrocardiogram taken one week later showed an upright T wave in lead 2 (fig. 2 B). At the end of two months he was markedly improved. The duodenal ulcer, as shown by roentgen examination, had completely healed. By October 30 he was able to go up and down stairs twice a day without discomfort. For as long as two weeks at a time he did not take glyceryl trinitrate. He went motoring and was able to walk from four to six blocks on the level.

In May 1931 he began going to business and commuting from Bronxville to New York by train. There was a little substernal pressure at times, particularly when he bent over to tie his shoes or after his bath.

In June 1932 he stated that there had been no severe pain for a year and that he had not seen a physician during this period. He had not taken glyceryl trinitrate for ten months. Improvement was continuing.

In June 1933 he said that he was "getting better all the time." He had taken only one glyceryl trinitrate tablet in twenty months and this after walking in a wind. There were, however, slight twinges of precordial discomfort, chiefly when he moved about within an hour after a meal. He had gained 11 pounds

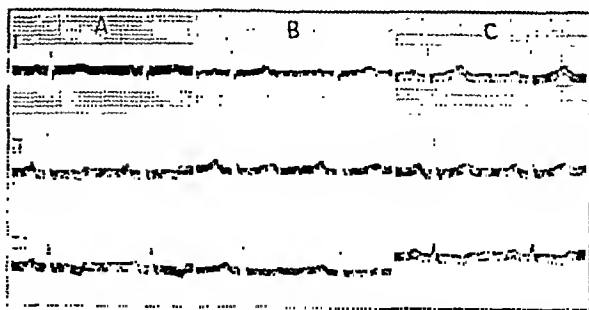


Fig. 2 (case 2).—Electrocardiograms of a man aged 58 who obtained marked permanent relief until his death from coronary occlusion more than six and one-half years after injection. A, March 15, 1930. (A record taken one week earlier was identical.) On March 19, paravertebral block was done. B, March 27 (eight days after injection). C, June 18, 1934.

(5 Kg.) in the past year. The blood pressure was 136 systolic and 80 diastolic. The electrocardiogram remained normal (fig. 2 C).

He continued to work regularly until the day before his death. On Thanksgiving Day 1936, while at dinner carving the family turkey, he suddenly had intense substernal pain and went into shock. He died within twelve hours and in the opinion of his physician had a terminal coronary occlusion.



The electrocardiograms of these 2 patients showed modifications in the T waves occurring respectively six weeks and one week after injection. Coincidentally with progressive improvement, the electrocardiograms became normal and remained so in both cases for more than six years. A similar modification in the form of the graphic record was reported by Raney,<sup>11</sup> after cutting the second, third, fourth and fifth rami communicantes and sectioning the sympathetic chain between the fifth and sixth dorsal ganglions on the left side. The patient had suffered from severe cardiac pain due to disease of the coronary arteries and obtained complete relief. On the second day after operation, the T wave in lead 1, which had been negative, became upright. Such changes in the electrocardiogram furnish at least suggestive support to the experimental observations of Hall and his collaborators, to which reference has already been made. It seems unlikely that reversal in the direction of the T waves occurring so soon after operation is the result of anatomic changes in the heart. It is more probable that they are due to an altered physiologic state of the coronary circulation, possibly due to release of spasm. If vasoconstriction was thus permanently diminished or abolished, an increase in coronary flow might be anticipated. Perhaps, therefore, interruption of the sensory pathways for pain not only brings relief to the patient but, over a period of time, results in an improvement in the supply of blood to the heart. Should this concept prove to be valid, relief from painful discomfort earlier in the course of coronary disease might be expected to exert a favorable influence on its course. Whether, in any of these advanced cases, life was prolonged, it is not possible to say. Certainly, in them, unilateral alcohol block did not prevent the occurrence of coronary occlusion or of sudden death.

#### SUMMARY AND CONCLUSIONS

1. Forty-five patients with severe paroxysms of cardiac pain, due in thirty-six instances to coronary sclerosis, were given paravertebral injections of alcohol. Four patients died within three weeks and 1 was lost to follow-up examination, so that the final analysis was based on 40 cases. Relief was obtained in 77.5 per cent; in 22.5 per cent treatment failed to give relief. The relief was marked and permanent in 47.5 per cent of the total number. Eight cases have been followed for more than six years; 2 of these have been followed for nine years.

2. There was no immediate operative mortality. In 5 cases pleural effusion developed on the left side; the fluid was absorbed without aspiration within a week. Most of the patients suffered from painful intercostal neuritis, which lasted from a few weeks to several months.

3. Many of these patients who had been bedridden or confined to the house were able to resume an active life.

4. The appearance of Horner's syndrome was not essential for a successful result.

5. Changes in the form of the electrocardiogram in the direction of normal suggest that interruption of the sensory pathways, in certain cases, may diminish or abolish spasm in the coronary bed. This is to be regarded as a desirable effect, tending to promote a more adequate collateral flow in unaffected vessels. On

the basis of this evidence and in view of experiments on dogs, it is suggested that interruption of pathways for pain not only affords relief to the patient but may exert a beneficial effect on the coronary circulation. Under these circumstances, earlier relief of pain in patients with coronary sclerosis might be expected to influence the course of the disease in a favorable manner. In the cases of more advanced coronary disease here reported, unilateral block with alcohol did not prevent the occurrence of coronary occlusion or of sudden death.

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## THE EFFECT OF DEPRIVING THE INFANT OF ITS PLACENTAL BLOOD

ON THE BLOOD PICTURE DURING THE  
FIRST WEEK OF LIFE

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Although much has been written concerning the blood of the infant, knowledge of the early postnatal blood picture including changes at birth and during the first week of life is incomplete and controversial. Our interest in the blood of the newborn was stimulated by the numerous recent reports on collection of placental blood for "blood banks." Those who have advocated the use of placental blood for transfusion purposes,<sup>1</sup> have failed to recognize possible deleterious effects on the infant when it is deprived of this blood. It is essential to clamp the umbilical cord immediately after birth in order to salvage an adequate amount of placental blood. Even when placental blood is not collected, the practice of clamping the cord promptly at birth is a rather common one.

It is natural for the newborn infant to retrieve most of the blood in its placental circulation if severing of the cord is delayed for a sufficiently long time. Haselhorst and Allmeling<sup>2</sup> found that the average amount of blood in the placental vessels of 120 infants was 104 cc. They showed that 51 per cent of this flowed into the infant from the placenta in the first minute

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This study was made possible by a grant-in-aid of research from the John and Mary R. Markle Foundation to Dr. Windle. The staff of the Passavant Memorial Hospital cooperated in obtaining supplementary data.

1. These authors include:

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Goodall, Anderson, Altman and McPhail,<sup>3</sup> Grodberg and Carey.<sup>4</sup>

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after delivery, 79 per cent reached the child in the first five minutes and 91 per cent in the first ten minutes. Goodall and his colleagues<sup>3</sup> obtained an average of 125 cc. of blood from the placenta for use in a blood bank. Grodberg and Carey<sup>4</sup> salvaged a maximum of 215 cc. of placental blood from one patient.

The actual total volume of blood of the human fetus and its placenta has never been determined, but in sheep, according to Barcroft and Kennedy,<sup>5</sup> it is about 150 cc. per kilogram, or 15 per cent of the body weight of the fetus alone. About one fourth of this blood was in the placental circulation near term. Lucas and Dearing<sup>6</sup> estimated the blood volume of human infants by the vital dye method. They obtained an average of 531 cc. of blood from 12 newborn infants three to twenty-four hours after birth. This was 15.5 per cent of the body weight. Therefore the loss of 125 cc. of placental blood deprives the child of about one fourth (24 per cent) of its total blood volume. Such a great blood loss to the infant, even though performed for a good cause, should be viewed with alarm.<sup>6a</sup>

Our purpose in the present study was to find out whether deprivation of the infant of its placental blood by tying of the cord immediately at birth influenced the red corpuscle count and hemoglobin content of the blood during the first week of life. In reviewing the voluminous literature on the blood picture in the newborn one finds that the time at which the umbilical cord was clamped is seldom stated, that the source of the blood and method of taking the sample are often omitted, that the methods of estimating hemoglobin vary widely and that the hemoglobin content, frequently reported in percentage, cannot always be transposed into grams per hundred cubic centimeters. The average figures reported for the number of red corpuscles and the amount of hemoglobin vary all the way from those encountered in normal adults to values as high as 6.5 million red corpuscles per cubic millimeter and 23 Gm.<sup>7</sup> of hemoglobin per hundred cubic centimeters. Individual counts greater than 7 million are not uncommon. Many investigators have noted a slight rise in red corpuscle and hemoglobin values during the first few days of life.

Only a few investigators<sup>8</sup> have studied the effect of early and late clamping of the umbilical cord on the blood picture of the infant. Their results are listed in table 1. Individually the data are incomplete and for the most part insignificant from a statistical point of view, but impressiveness is gained by assembling them. The figures clearly indicate a relationship between the time of ligation of the umbilical cord and the blood

picture, for red corpuscle and hemoglobin values were uniformly higher when the infants were allowed to retrieve placental blood at birth than when deprived of it by early clamping of the cord. Our own results demonstrate this fact even more clearly.<sup>9</sup>

#### PROCEDURE

The present study was performed on normal infants at the Cook County Hospital. One of us (Q. B. D.) was present at each delivery. All but two deliveries were conducted without anesthesia and with no medication previous to the third stage. Except when noted in the tables, the deliveries were normal in every way including their duration.

Red corpuscle counts were made with Bureau of Standards equipment and hemoglobin determinations with a Hellige-Sahl apparatus calibrated by the oxygen capacity technic. Blood studies were made on venous blood of the mothers during labor. Anemia was present in only 1 mother and was slight. The cords were

TABLE 1.—Summary of Data from the Literature

Investigators	Number of Sub-jects	Approximate Age at Sampling, Days	Red Blood Corpuscles		Hemoglobin	
			Immediate,* Mill. per C. Mm.	Delayed,* Mill. per C. Mm.	Immediate, Gm. per 100 Cc.	Delayed, Gm. per 100 Cc.
Hélot <sup>8</sup> (1877).....	12	?	5.05	....	....	....
	10	?	....	5.05	....	....
Hayem <sup>8</sup> .....	6	?	5.00	....	....	....
	8	?	....	5.65	....	....
Porak <sup>8</sup> (1878).....	5	?	4.38	....	....	....
	9	?	....	5.22	....	....
Schiff <sup>20</sup> (1892).....	8	1	7.76	....	....	....
		4	7.26	....	....	....
	8	1	....	7.68	....	....
		4	....	9.08	....	....
Börner <sup>8</sup> (1928).....	4	½ to 4	4.44	....	17.4	....
	13	½ to 4	....	4.07	....	21.0
Phillips <sup>8</sup> (1935).....	37-38	1	4.90	....	15.6	....
	33	1	....	6.06	....	19.3
Frisehkon and Rucker <sup>8</sup> (1939)	333	1 to 1½	5.20	....	....	....
	50	1 to 1½	....	5.78	....	....

\* Exact time of tying cord unknown.

clamped as soon after delivery as possible in one series of 25 newborn infants (table 2); the average time elapsing was thirty seconds or less. In another 25 infants (group A in table 3) the cords were not clamped until the placenta had separated from the uteri. This usually occurred within ten minutes after delivery. It was found that the baby receives an additional amount of blood between the time the cord stops pulsating and the time the uterus contracts firmly with separation of the placenta. The blood in ten placentas was collected and measured at the end of pulsations (about three minutes after birth) and was found to average 62.4 cc.<sup>10</sup> Only a few cubic centimeters of blood at best can be obtained from the umbilical cord after separation of the placenta. In fact, we were unable to draw enough blood from a number of the cords to give adequate determinations of hemoglobin and corpuscles. In a supplementary series of four infants (group B in table 3) the clamping was delayed two to eight minutes,

3. Goodall, J. R.; Anderson, L. O.; Altman, G. T., and McPhail, F. L.: Surg., Gynec. & Obst. 66: 176 (Feb.) 1938.

4. Grodberg, B. C., and Carey, E. L.: New England J. Med. 210: 471 (Sept. 29) 1938.

5. Barcroft, J., and Kennedy, J. A.: J. Physiol. 95: 173 (Feb. 14) 1939.

6. Lucas, W. P., and Dearing, B. F.: Blood Volume in Infants Estimated by the Vital Dye Method, Am. J. Dis. Child. 21: 96 (Jan.) 1921.

6a. We are at present studying the blood volume of newborn infants by the Evans blue method and find it to be much lower (10 per cent of body weight) than reported by Lucas and Dearing.<sup>6</sup> The placental blood therefore is probably equal to an even greater percentage of the blood volume of the infant than indicated above.

7. According to adult standards, 15 Gm. of hemoglobin equals approximately 100 per cent.

8. Hélot, P.: Union méd. de la Seine-inf. 16: 193, 1877; cited by Porak, p. 370. Hayem, G.: Cong. period. internat. d. sc. méd. Compt. rend., 1878, p. 211; cited by Porak, p. 370. Porak, C.: Ann. de gynéc. 110: 189, 291, 363 and 446, 1878. Börner, R.: Arch. f. d. ges. Physiol. 220: 717, 1928. Phillips, B. L.: Unpublished data; cited by Osgood, E. E.: A Textbook of Laboratory Diagnosis, Philadelphia, P. Blakiston's Son & Co., 1935. Frisehkon, H. B., and Rucker, M. P.: Am. J. Obst. & Gynec. 38: 592 (Oct.) 1939. Schiff.<sup>20</sup>

9. DeMarsh, Q. B.; Windle, W. F., and Alt, H. L.: Proc. Soc. Exper. Biol. & Med. 44: 662 (June) 1940.

10. Pulsations indicate that the arterial channels to the placenta are unoccluded. Cessation of pulsation is not an indication that the placental vessels have emptied themselves of blood. Expulsion of blood from capillaries and veins of the placenta into the infant appears to be accomplished by uterine compression of the placenta as well as by vasoconstriction of its vessels.

but for one reason or another birth conditions seemed to fit neither of the two strictly defined categories. The averages of all 29 delayed cases are approximately the same as those of group A alone and were used in construction of chart 1.

Red corpuscle counts and hemoglobin determinations were made on umbilical cord blood and on blood from the infant taken twenty to seventy-five minutes, one day, three to four days and six to seven days after birth. Blood samples were obtained from the heel of the infant; the stabs were sufficiently deep to allow the blood to flow freely without squeezing the heel. Analyses were made promptly after the blood was drawn.

Daily reticulocyte counts were made in six newborn infants whose cords were clamped early and in six

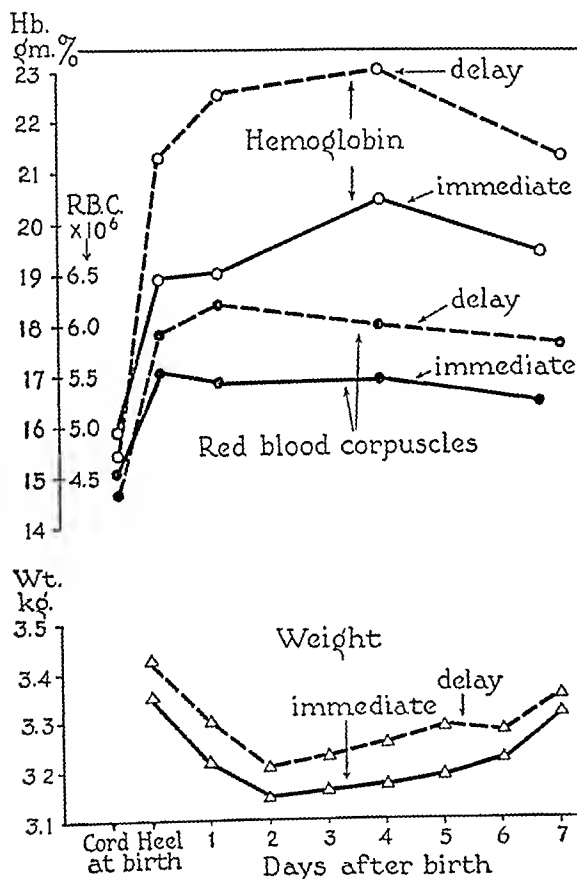


Chart 1.—Graphic reproduction of the average number of red corpuscles, amount of hemoglobin and body weight of infants from birth to the seventh day. Solid lines connect values for infants whose cords were clamped immediately; broken lines, the values after delayed clamping.

whose cords were clamped late. The reticulocyte preparations were made by placing a small drop of blood between two cover slips covered with films of brilliant cresyl blue. In about two minutes the slips were pulled apart, allowed to dry and stained by Wright's method. To estimate the percentage of reticulocytes, 500 corpuscles on each of two cover slips were examined.<sup>11</sup>

#### RESULTS

**Red Corpuscles and Hemoglobin.**—The result of the red corpuscle counts and hemoglobin estimations are recorded in tables 2 and 3. Averages are shown graphically in chart 1. The average values for cord

blood were 4.48 million red corpuscles per cubic millimeter and 15.7 Gm. of hemoglobin per hundred cubic centimeters. They were approximately the same whether the cord was clamped early or late. Within twenty to seventy-five minutes after birth the red corpuscle and hemoglobin values in blood from the heel were much higher than in the blood obtained from the umbilical cord. Thenceforth throughout the week the infants whose cords were clamped early had significantly lower corpuscle and hemoglobin values than did those whose cords were clamped late. During the first week the former group averaged 5.45 million red corpuscles per cubic millimeter and 19.5 Gm. of hemoglobin per hundred cubic centimeters, whereas the latter group averaged 6.01 million red corpuscles and 22.1 Gm. of hemoglobin. The difference between the two groups at each age period was statistically significant, as may be seen in table 4. It was more significant in respect to number of corpuscles at one, three to four and six to seven days after birth than on the day of birth. A peak was reached in the hemoglobin value at three to four days in both series of infants. It was not accompanied by a rise in number of red corpuscles.

The difference in number of red corpuscles and amount of hemoglobin between blood from the cord and that from the heel of the infant within an hour after birth is truly surprising.<sup>12</sup> We thought that there might be a discrepancy between capillary and venous blood. This was suggested by several observations in the literature. Waugh and his colleagues<sup>13</sup> reported 15 to 15.5 Gm. of hemoglobin in blood from umbilical cords as well as from venous sinuses during the first week of life. The umbilical cords were usually tied after pulsations had ceased. Osgood,<sup>14</sup> who tied the cords immediately after birth, found on the average 17.2 Gm. of hemoglobin per hundred cubic centimeters of venous sinus blood during the first four days. This declined to 16 Gm. by the tenth day. Red corpuscles averaged 4.6 million per cubic millimeter during the first ten days of life. These values do not differ greatly from our own results on umbilical cord blood but they are considerably lower than those we obtained from blood taken from the heel.

Haden and Neff<sup>15</sup> compared capillary and venous sinus blood of newborn infants. They found red corpuscles more numerous in capillary blood. Duke and Stofer<sup>16</sup> discovered a similar discrepancy between capillary and venous blood of patients with pernicious anemia. This blood, like that of the newborn, contains many large corpuscles. They suggested that these macrocytes occluded capillaries and led to concentration of the corpuscles there. Other investigators have failed to confirm the difference between capillary and venous blood of the newborn.<sup>17</sup>

We have made comparisons between samples obtained from the superior sagittal sinus (or jugular vein) and from the heel capillaries of six normal infants, as well as between cubital vein and finger blood from one adult with pernicious anemia. Our results, recorded in table 5, show little difference between capillary and venous blood in respect to the number of red

12. Recent studies on development of the blood picture in prenatal and postnatal life of the cat have demonstrated a similar although considerably smaller rise in number of red corpuscles at birth than that observed in infants (Windle, W. F.; Sweet, Marion; and Whitehead, W. H.: *Anat. Rec.* 78: 321-332 [Nov. 25] 1940). All the blood samples were drawn from veins in these experiments.

13. Waugh, T. R.; Mercbant, F. T., and Maughan, G. B.: *Am. J. M. Sc.* 198: 646 (Nov.) 1939.

14. Osgood, E. E.: *A Textbook of Laboratory Diagnosis*, Philadelphia, The Blakiston Company, 1940; personal communication to the authors.

15. Haden, R. L., and Neff, F. C.: *Volume Index and Color Index of Red Blood Corpuscles in New-Born Infants*, *Am. J. Dis. Child.* 25: 458 (Oct.) 1924.

16. Duke, W. W., and Stofer, D. D.: *Comparison of Capillary and Venous Blood in Pernicious Anemia*, *Arch. Int. Med.* 30: 94 (July) 1922.

17. Lucas, W. P.; Dearing, B. F.; Hoobler, H. R.; Cox, Anita; Jones, Martha R., and Smyth, F. S.: *Blood Studies in Newborn: Morphological; Chemical; Coagulation; Urobilin and Bilirubin*, *Am. J. Dis. Child.* 22: 525 (Dec.) 1921. Andersen, Bent, and Ortmann, Gudrun: *Acta med. Scandinav.* 93: 410, 1937.

11. Only 500 corpuscles were examined in the two cover slips in several preparations.

TABLE 2.—Amount of Hemoglobin and Number of Red Corpuscles in Blood of Infants in Which the Umbilical Cord Was Clamped Immediately

Subject	Race	Sex	Para	Delay (Sec.)	Amount of Hemoglobin (Gm. per 100 Cc.)										Number of Red Corpuscles (Mil. per C. Mm.)									
					M	C	B	1	2	3	4	5	6	7	M	C	B	1	2	3	4	5	6	7
1	W	M	2	0	14.00	14.00	15.00	17.00	.....	.....	18.00	.....	17.00	.....	4.71	3.31	4.70	5.40	.....	.....	4.09	.....	4.45	.....
2	N	F	5	0	12.00	13.40	17.00	15.50	.....	.....	17.00	.....	15.50	.....	3.88	3.73	4.43	4.36	.....	.....	4.73	.....	4.03	.....
3	N	M	0	0	11.50	.....	20.00	19.50	.....	.....	18.00	.....	17.00	.....	3.96	.....	6.40	5.81	.....	.....	5.13	.....	4.27	.....
4	N	F	0	0	12.00	17.00	19.50	20.50	.....	.....	21.00	.....	19.50	.....	3.95	4.43	5.85	6.06	.....	.....	5.90	.....	5.84	.....
5	N	M	3	0	12.50	17.00	21.50	18.25	.....	.....	19.00	.....	19.00	.....	4.20	4.03	6.03	5.09	.....	.....	5.32	.....	5.50	.....
6	N	F	2	0	11.50	17.00	20.00	20.00	.....	.....	23.00	.....	21.00	.....	4.74	5.35	6.26	6.11	.....	.....	5.72	.....	6.08	.....
7	N	F	0	0	11.00	17.50	18.50	17.50	.....	.....	19.50	.....	17.25	.....	5.13	5.18	5.43	5.21	.....	.....	5.34	.....	5.48	.....
8	N	F	0	0	12.00	14.00	17.00	17.50	.....	.....	19.00	.....	18.25	.....	4.38	3.90	5.22	4.90	.....	.....	6.28	.....	5.44	.....
9	N	F	4	30	12.00	14.00	18.50	18.75	.....	.....	19.00	.....	19.00	.....	3.96	4.02	5.62	5.19	.....	.....	5.80	.....	5.03	.....
10	N	M	0	0	12.25	16.50	19.50	19.00	.....	.....	19.00	.....	18.00	.....	5.27	5.50	6.07	5.40	.....	.....	4.58	.....	5.33	.....
11	W	F	1	0	12.00	19.50	22.00	20.50	.....	23.00	.....	.....	20.00	.....	3.87	5.24	5.54	5.41	.....	5.09	.....	.....	5.41	.....
12	N	M	1	30	12.75	15.00	18.00	19.50	.....	23.00	.....	.....	20.00	.....	5.03	4.25	6.20	6.25	.....	6.34	.....	.....	5.41	.....
13	W	M	2	30	12.50	14.50	15.50	16.50	.....	19.00	.....	.....	22.50	.....	4.78	4.85	4.99	6.00	.....	5.82	.....	.....	5.04	.....
14	N	M	1	0	9.00	14.50	18.50	19.50	.....	21.00	.....	.....	20.50	.....	3.90	3.84	4.98	6.03	.....	5.44	.....	.....	5.15	.....
15	N	M	1	0	13.00	16.00	17.50	18.50	.....	22.00	.....	.....	18.50	.....	5.44	5.03	5.64	6.51	.....	5.13	.....	.....	5.27	.....
16	W	F	0	0	12.75	14.75	22.00	21.00	.....	.....	21.00	.....	21.00	.....	4.15	4.20	5.91	5.62	.....	.....	6.10	.....	5.71	.....
17	W	M	0	0	14.00	19.00	20.00	18.25	.....	.....	22.50	.....	22.00	.....	5.50	5.07	5.76	5.34	.....	.....	6.32	.....	5.66	.....
18	W	M	0	0	12.50	16.00	19.25	19.00	.....	.....	22.00	.....	.....	.....	4.62	4.65	5.92	5.33	.....	.....	6.13	.....	5.25	.....
19	W	F	0	0	11.00	.....	20.00	18.50	20.00	21.00	.....	.....	17.50	.....	4.31	.....	5.62	4.54	5.50	4.80	.....	.....	4.04	.....
20	N	F	0	0	14.50	14.25	18.50	19.00	.....	.....	18.50	.....	.....	.....	16.50	4.88	4.91	4.22	3.41	.....	5.00	.....	5.20	.....
21	N	F	1	0	.....	15.50	16.50	17.50	.....	.....	16.50	.....	.....	.....	16.50	.....	4.18	5.70	4.57	.....	4.69	.....	4.80	.....
22	W	M	1	30	11.50	17.25	20.50	23.00	.....	.....	22.50	.....	.....	.....	22.50	4.22	5.47	6.33	6.35	.....	6.19	.....	6.21	.....
23	W	M	0	30	12.00	16.00	18.00	20.00	.....	.....	23.50	.....	21.00	.....	3.69	4.19	4.57	5.63	.....	.....	4.82	.....	5.07	.....
24	W	M	4	30	13.50	.....	19.25	19.50	.....	.....	21.00	.....	22.50	.....	4.68	.....	5.22	6.41	.....	.....	5.78	.....	6.32	.....
25	N	M	1	30	11.50	17.00	21.50	22.50	.....	.....	23.00	.....	22.00	.....	3.80	4.95	6.25	5.74	.....	.....	5.71	.....	5.82	.....
Average.....					12.26	15.90	18.94	19.05	.....	20.48	.....	.....	19.42	.....	4.46	4.56	5.57	5.47	.....	5.49	.....	.....	5.27	.....
S. D. (σ).....					1.13	1.63	1.86	1.67	.....	2.06	.....	.....	2.12	.....	0.54	0.62	0.65	0.81	.....	0.61	.....	.....	0.61	.....
σ average.....					0.24	0.26	0.38	0.35	.....	0.42	.....	.....	0.43	.....	0.11	0.14	0.13	0.17	.....	0.13	.....	.....	0.13	.....

M = maternal values; C = blood from umbilical cord; B = blood from heel of infant twenty to seventy-five minutes after birth; 1, 2, etc. = days after birth; S. D. (σ) = standard deviation of the distribution; σ average = standard deviation of the average ( $\frac{\sigma}{\sqrt{N-1}}$ ); delay = time elapsing between birth and clamping of cord.

TABLE 3.—Amount of Hemoglobin and Number of Red Corpuscles in Blood of Infants in Which Clamping of the Umbilical Cord Was Delayed

Group A				Delay (Min.)	Amount of Hemoglobin (Gm. per 100 Cc.)										Number of Red Corpuscles (Mil. per C. Mm.)										
Sub- ject	Race	Sex	Para		M	C	B	1	2	3	4	5	6	7	M	C	B	1	2	3	4	5	6	7	
1 D	N	F	3	8	13.50	.....	20.50	23.50	.....	.....	25.00	.....	24.00	.....	4.54	.....	6.35	6.41	.....	.....	7.34	.....	6.20	.....	
2 D	W	M	0	16	14.50	.....	20.00	23.00	.....	.....	24.50	.....	21.00	.....	4.87	.....	5.80	6.54	.....	.....	6.92	.....	6.33	.....	
3 D	W	M	2	7	14.00	.....	15.50	20.50	21.00	.....	22.50	.....	24.50	.....	4.77	4.26	6.44	6.14	.....	.....	6.78	.....	6.46	.....	
4 D	N	M	0	8	11.75	16.50	21.50	21.00	.....	.....	22.00	.....	21.00	.....	4.40	4.95	6.15	6.63	.....	.....	5.81	.....	5.98	.....	
5 D	N	M	0	8	12.50	.....	23.00	23.00	.....	.....	26.00	.....	22.00	.....	4.14	.....	7.03	7.53	.....	.....	6.69	.....	5.69	.....	
6 D	W	F	3	8	11.50	.....	24.00	22.50	.....	.....	26.25	.....	22.50	.....	3.96	.....	6.74	5.82	.....	.....	6.24	.....	6.11	.....	
7 D	W	F	0	10	13.50	.....	23.00	26.50	.....	.....	22.00	.....	22.00	.....	4.80	.....	6.28	7.14	.....	.....	8.30	.....	5.91	.....	
8 D	N	F	1	10	12.00	15.25	23.50	24.00	.....	.....	24.50	.....	25.50	.....	3.95	4.16	5.87	6.00	.....	.....	6.48	.....	6.82	.....	
9 D	N	M	4	23	13.00	.....	22.50	26.00	.....	.....	26.50	.....	25.50	.....	4.46	.....	6.05	6.20	.....	.....	6.12	.....	6.10	.....	
10 D	N	F	0	7	14.00	14.00	17.50	20.00	.....	.....	22.00	.....	19.00	.....	3.95	4.58	5.08	5.74	.....	.....	5.51	.....	5.03	.....	
11 D	N	M	0	9	12.00	.....	28.00	24.00	.....	.....	24.00	.....	21.00	.....	4.27	.....	7.01	6.82	.....	.....	6.38	.....	5.91	.....	
12 D	N	F	2	5	12.25	19.00	21.00	19.50	.....	22.00	.....	.....	20.00	.....	3.72	5.42	4.95	4.67	.....	5.09	.....	.....	6.51	.....	
13 D	W	F	1	6	13.00	14.50	20.00	23.50	.....	21.00	.....	23.50	.....	.....	4.31	3.63	5.63	5.88	.....	6.45	.....	6.00	.....	.....	
14 D	W	F	0	12	13.50	13.50	20.00	23.25	.....	24.50	.....	.....	20.00	.....	4.40	3.72	5.25	6.18	.....	6.28	.....	.....	5.01	.....	
15 D	N	F	1	2	14.50	12.50	18.00	18.00	.....	17.50	.....	.....	15.00	.....	4.00	3.75	4.81	4.80	.....	5.21	.....	.....	4.63	.....	
16 D	W	F	0	8	12.50	17.50	22.00	21.50	23.00	.....	23.00	.....	19.50	.....	4.32	4.48	6.45	5.56	6.75	.....	5.61	.....	5.68	.....	
17 D	W	F	1	29	13.50	18.00	.....	21.50	22.00	.....	21.50	.....	19.50	.....	4.46	4.91	.....	5.72	5.93	.....	6.21	.....	5.11	.....	
18 D	N	M	0	14	12.50	.....	20.00	24.50	.....	.....	24.00	.....	23.50	.....	4.27	.....	5.44	7.44	.....	7.06	.....	6.81	.....	.....	
19 D	N	F	0	20	12.50	.....	18.00	19.00	20.50	.....	20.50	.....	18.50	.....	4.53	.....	5.12	6.17	5.99	.....	5.64	.....	5.07	.....	
20 D	W	F	0	12	14.25	15.75	19.50	21.00	.....	.....	25.00	.....	20.00	.....	4.63	4.75	4.70	6.11	.....	.....	4.91	.....	5.62	.....	
21 D	W	F	5	25	12.50	.....	23.50	22.00	.....	.....	22.50	.....	22.00	.....	3.95	.....	6.14	6.18	.....	.....	5.75	.....	6.85	.....	
22 D	W	F	6	2	13.75	.....	26.00	22.00	20.00	.....	20.00	.....	.....	.....	4.77	.....	7.09	6.40	6.11	.....	6.20	.....	5.72	.....	
23 D	W	F	2	8	12.50	.....	21.00	22.50	23.00	.....	.....	21.50	.....	20.25	4.69	.....	6.81	6.46	6.25	.....	6.28	.....	5.81	.....	
24 D	W	F	3	6	12.00	.....	23.50	24.50	.....	21.00	.....	20.00	.....	19.50	3.77	.....	5.43	6.22	.....	6.33	.....	5.03	.....	5.12	.....
25 D	W	M	8	30	12.50	.....	22.00	21.00	.....	23.50	.....	24.50	.....	22.00	3.98	.....	5.86	7.50	.....	7.15	.....	6.77	.....	6.62	.....
Average.....					13.04	15.64	21.69	22.77	21.70	23.09			21.20		4.34	4.42	5.99	6.23	6.23	6.09			6.04	5.77	
S. D. (σ).....					1.61	1.41	2.47	2.28	.....	2.66			2.27		0.22	0.55	0.79	0.68	.....	0.63			.....	0.56	
σ average.....					0.21	0.45	0.52	0.47	.....	0.43			0.45		0.07	0.17	0.17	0.14	.....	0.14			.....	0.14	
Group B*																									
26 D	N	F	2	4	11.00	14.50	16.50	22.50	.....	.....	21.50	.....	.....	.....	3.44	3.67	4.70	6.00	.....	.....	5.94	.....	.....	.....	
27 D	W	F	2	8	12.00	.....	22.00	.....	25.00	.....	.....	.....	.....	.....	3.93	.....	5.91	.....	6.41	5.76	.....	.....	.....	.....	
28 D	W	F	0	2	10.50	14.50	17.25	19.00	.....	20.00	.....	.....	.....	.....	22.50	3.99	4.16	5.34	4.85	.....	4.53	.....	.....	6.23	
29 D	W	F	0	..	15.00	.....	21.50	20.00	.....	.....	24.00	.....	.....	.....	4.26	.....	6.59	6.21	.....	.....	6.08	.....	.....	6.20	
Average A + B.....					12.91	15.46	21.28	22.53	22.25	23.03			21.28		4.20	4.21	5.94	6.23	6.26	6.02			6.04	5.61	
S. D. (σ) A + B.....					1.19	1.78	2.61	2.61	1.15	2.68			2.23		0.27	0.51	0.77	0.69	.....	0.67			.....	0.56	
σ average A + B.....					0.23	0.32	0.50	0.22	.....	0.40			0.45		0.07	0.16	0.15	0.13	.....	0.13			.....	0.11	

corpuscles. The hemoglobin values obtained in venous blood of infants are comparable with the averages of those obtained in capillary blood (tables 2 and 3).

It is doubtful whether the sudden increase in the number of red corpuscles in the infant's circulating blood at the time of birth is due entirely to a difference between capillary and venous blood. Postnatal dehydration is an unlikely explana-

cytes. The reticulocyte count has been found by most authors<sup>22</sup> to average about 4 to 6 per cent at birth. It decreases to less than 1 per cent by the end of the first week. A slight rise in reticulocytes on the second day of life has been noted by Wollstein<sup>23</sup> and by Waugh and his colleagues.<sup>13</sup> Apparently no one has made comparative studies of the reticulocyte count in the newborn after early and after late tying of the cord. Our results in such a study are recorded in table 6. Averages are shown graphically in chart 2. When the umbilical cord was tied immediately, reticulocytes reached an average peak of 8.6 per cent at twenty-four hours and then decreased slowly. They did not fall below 6 per cent until the fifth day. When tying of the cord was delayed, reticulocytes averaged 5.8 per cent at their peak in twenty-four hours and then fell to 4 per cent by forty-eight hours. A more active blood formation when the cord is clamped early than when it is clamped late is suggested by the higher and more sustained rise in reticulocytes in the former group.

TABLE 4.—Mathematical Significance of Differences

Day	Hemoglobin			Red Blood Corpuscles		
	No. of Cases		Signifi- cance	No. of Cases		Signifi- cance
	Imme- diate	Delay		Imme- diate	Delay	
Birth.....	25	28	3.71	25	28	1.80
One.....	25	28	8.49	23	28	3.57
Three and four.	25	28	4.40	25	28	2.94
Six and seven...	25	26	3.07	25	26	3.38

$$\sigma = \sqrt{\frac{\sum F D^2}{N}} - e^2 \times \text{step interval}$$
$$\sigma \text{ Average} = \frac{\sigma}{\sqrt{N-1}}; \sigma \text{ Difference} = \sqrt{(\sigma \text{ Ave.}_1)^2 + (\sigma \text{ Ave.}_2)^2}$$
$$\text{Significance} = \frac{\text{numerical difference}}{\sigma \text{ difference}}$$

tion, because the change often occurs in less than half an hour. A possible explanation may be found in the relationship of the spleen to this phenomenon. Polycythemia due to splenic contractions during emotional excitement has been observed in the cat.<sup>18</sup> In prenatal life the smooth musculature of the fetal body is relatively inactive in comparison with that of the individual after birth.<sup>19</sup> The smooth muscle of the lamb's spleen begins to contract at birth.<sup>20</sup> Perhaps this throws a significant reserve of concentrated corpuscles into circulation. This could cause a rise in red corpuscles at birth. It is interesting to note that Horváth and Hollósi<sup>21</sup> observed more red corpuscles and hemoglobin in blood from the infant's umbilical artery than in that from the umbilical vein; blood drawn from the heel at birth showed even higher values. The course of blood circulating from the spleen to the heart and thence to the aorta and its branches is such that an increase in corpuscular concentration would manifest itself in the arteries before it would appear in the umbilical veins leaving the placenta.

TABLE 6.—Reticulocyte Counts, Percentage

	Sub- ject	Time After Birth						
		20-75 Min.	1 Day	2 Days	3 Days	4 Days	5 Days	6 Days
Cord clamped immediately	7	7.1	9.2	6.2	5.7	...	...	0.2
	8	5.8	8.8	8.8	6.7	6.4	2.0	1.1
	21	5.6	7.8	6.5	4.6	4.6	2.8	1.2
	26	6.0	6.6	9.4	6.0	4.2	2.8	1.2
	27	6.2	...	6.4	9.0	9.0	4.6	4.0
	28	...	10.4	...	...	5.6	...	0.5
	Average	6.1	8.6	7.5	6.4	6.0	3.1	1.6
Clamping of cord delayed	A 1D	2.4	5.2	3.1	2.6	0.4	...	...
	4D	3.4	4.1	3.7	3.1	2.6	...	...
	6D	6.5	5.0	2.4	2.6	5.4*	1.5	1.0
	7D	3.5	...	2.1	...	...	1.8	...
	30D	7.0	7.0	5.0	3.4	0.8	...	...
	Average	4.6	5.3	3.3	2.9	2.3	1.4	1.0
	B; 20D	5.0	7.5	7.9	5.9	2.0	...	...
	Average A + B	4.6	5.8	4.0	3.5	2.2	1.4	1.0

TABLE 5.—Comparison of Capillary and Venous Blood

Sub- ject	Age, Days	Cord Tied After Birth, Minutes	Red Blood Corpuscles		Hemoglobin	
			Capillary, Mil. per C. Mm.	Venous, Mil. per C. Mm.	Capillary, Gm. per 100 Ce.	Venous, Gm. per 100 Ce.
A	4	0	4.61 (H)	4.49 (V)	18.0 (H)	17.0 (V)
B	4	3	6.53 (H)	5.97 (S)	.....	22.5 (S)
C	4	3	6.00 (H)	5.98 (S)	.....	23.0 (S)
D	2	8	6.06 (H)	5.99 (S)	.....	.....
E	2	46	6.75 (H)	6.50 (S)	.....	24.0 (S)
F	2	15	6.13 (H)	5.56 (S)	.....	21.5 (S)
G*	Adult	..	1.93 (F)	1.85 (V)	.....	.....

\* Patient with pernicious anemia.  
(F) finger blood; (H) heel blood; (S) superior sagittal sinus blood;  
(V) jugular (in A) and eubital (in G) blood.

**Reticulocytes.**—Toward the end of the present study it occurred to us that depriving the infant of placental blood might result in increased erythropoiesis and that this would be reflected by an increase in the reticulo-

Blood drawn only about an hour after birth from infants whose cords had been clamped immediately contained more reticulocytes than did the blood from the other group. This is not surprising if our theory of splenic contraction at birth is true. The demand on the splenic reservoir may be greater in infants deprived of placental blood than in those getting it. Many of the corpuscles poured into the circulation from the spleen may well be reticulocytes.

**Jaundice.**—It has been suggested by Franklin<sup>24</sup> that delayed clamping of the cord results in greater incidence of jaundice than early clamping. Few infants of our series had jaundice which could be easily determined by inspection. In fact, it was recorded in only 3 of the 25 infants whose cords had been clamped immediately, 5 of the 25 whose cords had been clamped late and 2 of the 4 infants placed in the special

18. Izquierdo, J. J., and Cannon, W. B.: *Am. J. Physiol.* **84**: 545 (April) 1928; *ibid.* **86**: 145 (Aug.) 1928.  
19. Windle, W. F.: *Physiology of the Fetus*, Philadelphia, W. B. Saunders Company, 1940.  
20. Taylor, D. B., and Gotsev, T.: Unpublished data; cited by Barcroft, J.: *The Brain and Its Environment*, New Haven, Conn., Yale University Press, 1938.  
21. Horváth, Zoltán, and Hollósi, Charles: *Birth Pains and the Blood of the Newborn*, *Am. J. Dis. Child.* **49**: 689 (March) 1935.

22. Krumbhaar, E. B.: *J. Lab. & Clin. Med.* **8**: 11 (Oct.) 1922. Seyfarth, C., and Jürgens, R.: *Virehows Arch. f. path. Anat.* **266**: 676, 1928. Goldbloom, Alton, and Gottlieb, Rudolph: *Icterus Neonatorum*, *Am. J. Dis. Child.* **38**: 57 (July) 1929. Josephs, H. W.: *Medicine* **15**: 307 (Sept.) 1936.  
23. Wollstein, Martha: *Normal Blood in Infants and Children*, in Downey, H.: *Handbook of Hematology*, New York, Paul B. Hoeber, Inc., 1938, vol. 2, p. 924.  
24. Franklin, Morris: *Am. J. Obst. & Gynec.* **22**: 913 (Dec.) 1931.

group (B in table 3). Jaundice is probably a normal phenomenon in most instances.

**Weight.**—Several earlier investigators, according to Schiff,<sup>25</sup> claimed that infants whose cords were cut late had less loss of weight and more rapid gains to the original birth weight than did those whose cords were cut early. The average weights of the two groups of infants in the present study ran parallel during the first week of life (chart 1).

It is worth mentioning that Schiff<sup>25</sup> found an increased excretion of nitrogen in infants whose cords were cut early. He concluded that the placental blood acted as a source of nourishment which protected infants against the breakdown of body protein.

#### COMMENT

Deprivation of the infant of placental blood by clamping the umbilical cord immediately results in significantly lower values for red blood corpuscles and hemoglobin during the first week of life than are encountered when clamping is delayed. In addition, there is an increase in the number of reticulocytes in the blood; this indicates an increased demand for blood on the part of the infant. The placental blood normally belongs to the infant, and his failure to get this blood is equivalent to submitting him to a rather severe hemorrhage.

One can easily imagine that loss of as much as 25 per cent of the total blood volume in the newborn infant, as described earlier, may sometimes be critical. Failure to receive the placental blood may be especially harmful to infants born prematurely, to infants after a long, difficult labor and to infants suffering from some pathologic condition. Engel,<sup>26</sup> in the latter part of the nineteenth century, reported twice as great mortality in premature infants whose cords were tied early as in those whose cords were tied late. This is understandable because the placenta reaches maximum relative size at about the fifth month and contains a greater proportion of the fetal-placental blood volume in premature infants.

Deprivation of the placental blood also results in a relatively large loss of iron to the infants. Fullerton<sup>27</sup> and Stearns and McKinley<sup>28</sup> have recently called attention to the fact that the principal iron reserve of the newborn infant is in the circulating hemoglobin rather than in the tissues. Iron liberated during destruction of blood is stored in the tissues and utilized as needed for hemoglobin formation. The amount of iron lost to the newborn infant in 125 cc. of placental blood is sufficient to raise the hemoglobin in a 4 months old infant from 8.7 Gm. to 12 Gm. per hundred cubic centimeters.<sup>29</sup> Therefore it seems possible that loss of placental blood may be a factor predisposing infants to anemia during the nursing period.

25. Schiff, E.: *Jahrb. f. Kinderh.* 34: 159 and 459, 1892.

26. Engel, G.: *Zentralbl. f. Gynäk.* 9: 721, 1885.

27. Fullerton, H. W.: *Arch. Dis. Childhood* 12: 91 (April) 1937.

28. Stearns, Genevieve, and McKinley, J. B.: *J. Nutrition* 13: 143 (Feb.) 1937.

29. Calculation:

Blood in placenta = 125 cc.; hemoglobin 16 Gm. per hundred cubic centimeters; hemoglobin = 0.335 per cent iron

Total iron in placental blood =  $1.25 \times 16 \times 0.00335 = 67$  mg.

Infant age 4 months: Average weight = 5.5 Kg.; blood volume = 10.9 per cent;<sup>30</sup> hemoglobin = 12 Gm./100 cc.

Total circulating hemoglobin iron =  $5.5 \times 10.9 \times 12 \times 0.00335 = 241$  mg.

Total circulating hemoglobin iron minus iron in placental blood ( $241 - 67$ ) = 174 mg.

Theoretic hemoglobin of infant (depleted of iron reserve) deprived of the amount of iron present in placental blood.

$\frac{174}{241} \times 12$  Gm. = 8.7 Gm. per hundred cubic centimeters

It is our opinion that enough evidence is now available to condemn the practice of clamping the umbilical cord promptly after birth and incidentally to condemn the use of placental blood for transfusion purposes. A delay on the part of the obstetrician in clamping the cord, not only until pulsations cease but also until the placenta has separated from the uterus, will give the newborn infant the quota of blood that naturally belongs to him.

#### CONCLUSIONS

1. Deprivation of the infant of the portion of its blood that is in the placenta by clamping the umbilical cord immediately after birth influences the red corpuscle count and hemoglobin content of the blood during the first week of life. Those infants whose cords were not clamped until the placentas had separated from the uteri had on the average 0.56 million more red blood corpuscles per cubic millimeter and 2.6 Gm. more hemoglobin per hundred cubic centimeters during the first week than those whose cords were clamped immediately.

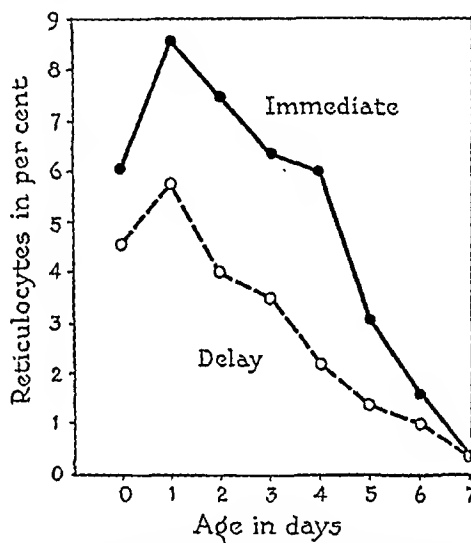


Chart 2.—Graphic reproduction of the average percentage of reticulocytes in the blood of infants from birth to the seventh day. Solid lines connect values for those whose cords were clamped immediately; broken lines, the values after delayed clamping. Six infants are represented in each series; had subject 26 D been omitted, a somewhat more striking difference between the two curves would have resulted.

2. Blood drawn from the infant's heel twenty to seventy-five minutes after birth had significantly higher red corpuscle and hemoglobin values than blood drawn from the umbilical cord at birth. It is possible that the spleen plays a part in bringing on this polycythemia of birth.

3. Higher reticulocyte counts in infants whose cords were clamped immediately suggested a greater demand for blood in this group than in the group whose cords were not clamped until placental separation.

4. Early clamping of the umbilical cord is equivalent to submitting the child to a hemorrhage at birth.<sup>30</sup>

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30. Since this article was submitted for publication many more determinations of the red corpuscles and hemoglobin have been made simultaneously on sinus and heel blood of newborn infants. Contrary to our first few observations, we find the values to be consistently lower in sinus blood. The difference in number of red corpuscles and amount of hemoglobin between the immediate and delay groups is similar to that found in capillary (heel) blood. The red corpuscles and hemoglobin in sinus blood show a sharp rise within an hour after birth in the delay group but not in the immediate group. Reticulocyte percentages in sinus blood in the two groups show the same difference found in capillary blood. These results will be reported in detail in a subsequent publication.





TABLE 1.—Results of Serologic Tests in Vaccinated and Nonvaccinated Persons Sick with Epidemic Influenza

Vaccinated Group	Protection Test								Complement Fixation Test					
	Acute				Convalescent				Acute			Convalescent		
	1:4	1:16	1:64	1:256	1:4	1:16	1:64	1:256	1:4	1:16	1:64	1:4	1:16	1:64
1.....	+	±	—	—	—	—	—	—	—	—	—	3+	+	—
2.....	±	±	—	—	—	—	—	—	—	—	—	3+	3+	—
3.....	2+	—	—	—	—	—	—	—	—	—	—	3+	3+	—
4.....	—	—	—	—	—	—	—	—	—	—	—	2+	—	—
5.....	—	—	—	—	—	—	—	—	—	—	—	3+	2+	—
6.....	3+	3+	2+	+	2+	2+	—	—	—	—	—	3+	—	—
7.....	+	+	±	—	±	—	—	—	—	—	—	4+	—	—
8.....	—	—	—	—	—	—	—	—	—	—	—	2+	—	—
9*	—	—	—	—	—	—	—	—	4+	3+	—	4+	2+	—
10.....	—	—	—	—	—	—	—	—	4+	—	—	4+	2+	—
11.....	—	—	—	—	—	—	—	—	2+	—	—	4+	—	—
12.....	±	—	—	—	—	—	—	—	3+	—	—	4+	4+	—
13.....	—	—	—	—	±	—	—	—	—	—	—	3+	—	—
14.....	—	—	—	—	—	—	—	—	AC	..	..	AC	..	..
15*	—	—	—	—	—	—	—	—	±	—	—	±	—	—
16.....	—	—	—	—	—	—	—	—	4+	4+	—	4+	4+	—
17.....	—	—	—	—	—	—	—	—	3+	—	—	4+	4+	—
18.....	—	—	—	—	—	—	—	—	—	—	—	4+	4+	2+
19.....	—	—	—	—	—	—	—	—	AC	..	..	AC	..	..
20.....	—	—	—	—	—	—	—	—	AC	..	..	AC	..	..
21.....	—	—	—	—	—	—	—	—	AC	..	..	4+	—	—
22.....	—	—	—	—	—	—	—	—	4+	—	—	4+	4+	4+
23.....	—	—	—	—	±	—	—	—	+	—	—	3+	4+	—
24*	—	—	—	—	—	—	—	—	3+	—	—	3+	—	—
25.....	—	—	—	—	—	—	—	—	—	—	—	4+	4+	±
26.....	+	—	—	—	—	—	—	—	4+	—	—	4+	4+	4+
27.....	+	—	—	—	—	—	—	..	2+	—	—	4+	4+	±
28.....	±	—	—	—	±	—	—	..	3+	—	—	4+	4+	4+
Control Group														
1.....	4+	4+	4+	4+	—	—	—	—	—	—	—	4+	4+	4+
2.....	4+	4+	4+	4+	+	±	±	..	—	—	—	4+	3+	—
3.....	4+	4+	4+	3+	—	—	—	—	—	—	—	4+	4+	—
4.....	4+	4+	4+	2+	—	—	—	—	—	—	—	4+	4+	—
5.....	4+	4+	4+	—	—	—	—	—	—	—	—	4+	4+	2+
6.....	3+	3+	2+	2+	—	—	—	—	—	—	—	—	—	—
7.....	2+	2+	2+	—	—	—	—	—	—	—	—	4+	+	—
8.....	3+	2+	2+	—	—	—	—	—	2+	—	—	4+	4+	—
9.....	2+	+	±	—	—	—	—	—	—	—	—	4+	4+	—
10.....	+	±	±	±	—	—	—	—	—	—	—	4+	4+	—
11.....	+	+	±	—	—	—	—	—	—	—	—	4+	2+	—
12.....	+	+	±	—	—	—	—	—	4+	—	—	3+	4+	4+
13.....	+	+	—	—	—	—	—	—	—	—	—	4+	—	—
14.....	+	+	—	—	—	—	—	—	—	—	—	4+	4+	—
15.....	±	±	—	—	—	—	—	—	—	—	—	4+	4+	—
16.....	+	+	—	—	—	—	—	—	2+	—	—	3+	—	—
17.....	+	—	—	—	—	—	—	—	4+	—	—	4+	4+	—
18.....	2+	2+	+	±	+	—	—	—	—	—	—	—	—	—
19.....	3+	3+	3+	2+	2+	—	—	—	—	—	—	—	—	—
20.....	+	—	—	—	—	—	—	—	—	—	—	—	—	—
21.....	±	—	—	—	—	—	—	—	—	—	—	4+	4+	4+
22*	—	—	—	—	—	—	—	—	4+	4+	—	4+	4+	4+
23*	—	—	—	..	—	—	—	..	4+	4+	—	4+	4+	—
24.....	+	—	—	—	—	—	—	—	—	2+	—	4+	4+	—
25.....	3+	3+	2+	2+	—	—	—	—	—	—	—	3+	—	—
26.....	4+	+	—	—	4+	—	—	—	—	—	—	4+	4+	4+
27.....	±	—	—	—	—	—	—	..	AC	..	..	4+	4+	—
28.....	2+	2+	+	±	—	—	—	—	—	—	—	—	—	—
29.....	3+	3+	3+	2+	+	+	±	—	—	—	—	—	—	—
30.....	—	—	—	—	—	—	—	—	AC	..	..	AC	..	..
31.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—
32.....	—	—	—	—	—	—	—	—	4+	4+	—	4+	4+	4+
33.....	3+	3+	2+	+	—	—	—	—	—	—	—	—	—	—
34.....	4+	3+	3+	..	+	+	±	—	—	—	—	—	—	—
35.....	—	—	—	—	—	—	—	—	4+	+	—	4+	4+	4+
36*	2+	2+	+	+	—	—	—	—	—	—	—	—	—	—
37.....	—	—	—	—	—	—	—	—	4+	—	—	4+	—	—
38.....	—	—	—	—	—	—	—	—	AC	..	..	4+	4+	—
39.....	±	—	—	—	—	—	—	—	—	—	—	—	—	—

The protection tests or virus neutralizations are reported as the extent of pneumonia in the lungs of each mouse. Mice that died shortly after inoculation have been omitted. Where three tests are shown for a single case the second represents a 1:8 and the third a 1:32 dilution of serum. The complement fixation test was run at three serum dilutions. Asterisks identify cases in which influenza may not have been present.



mainly on two observations: that vaccines elicit neutralizing antibodies and that persons with high antibody titers are in the main less susceptible to influenza than those with low titers. There is further encouragement in the successful vaccination of laboratory animals. It may well be that individuals with high antibody titers due to a natural encounter with virus may have superior and different resistance than those with similar titers the results of vaccination. Antibodies are only one measure of resistance. Tissue resistance may be much more important. The vaccine used in this study seems to be effective in eliciting antibodies. Yet it did not prevent influenza.

Against this failure to prevent influenza must be considered the evidence that the duration of the disease and pulmonary involvement seem to have been reduced by vaccination. If this can be proved to be consistently true, the advantages of vaccination might be much more conspicuous and important during a pandemic characterized by severe pulmonary complications and a high mortality rate.

We hope that our experience will induce other hospitals to undertake the etiologic diagnosis of influenza. The neutralization test is a simple and conclusive

TABLE 2.—An Epidemic of Influenza: Frequency of Certain Signs and Symptoms Among 26 Vaccinated and 32 Not Vaccinated Patients

	Vaccinated	Not Vaccinated
Sudden onset.....	21	30
Cough.....	23	30
Aches and pains.....	21	28
Fever.....	50	29
Chilliness or chills.....	18	24
Weakness.....	15	17
Headache.....	8	10
Cervical adenitis.....	3	2
Injected pharynx.....	17	19
Lung signs.....	7	13
Leukopenia.....	12	18

procedure well suited to the study of individual cases or small groups of cases. The complement fixation test is equally definite and the reactions are very sharp. It is much less expensive and time consuming if many samples are to be tested. Present indications are that complement fixation will prove to be invaluable in the diagnosis of various virus diseases. We have used it for a number of years in the diagnosis of lymphocytic choriomeningitis. In the present work considerable difficulty was experienced with anticomplementary reactions. When these were finally overcome, no serum remained from certain patients and these appear in table 1 as AC. Unfortunately antigen must be freshly prepared at present. If some means were found to preserve it and to supply it to diagnostic laboratories the complement fixation test could readily be introduced wherever Wassermann tests are now performed. Much would be gained by broadening the front on which influenza is now being observed and attacked.

Our results show that on occasion one of the tests may be negative when the other is positive. This does not occur often enough to detract seriously from the value of either.

#### CONCLUSIONS

An epidemic of influenza A occurred among a hospital employee population of 826 adults, half of whom had recently received the vaccine of Horsfall and Lennette. Vaccine was found to increase the neutralizing antibodies but not to prevent influenza. There is evidence that it may have reduced the incidence and favorably modified the severity of the disease.

## THE KENNY TREATMENT OF INFANTILE PARALYSIS

### A PRELIMINARY REPORT

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AND

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MINNEAPOLIS

NOTE.—The following article is a preliminary report on the treatment of cases of acute infantile paralysis by the Kenny method. The authors state that this does not represent any original work on their part but is strictly a report of observation of the treatment as carried out by Miss Elizabeth Kenny and attempts only to present her ideas. Results of treatment of late cases were not included in this report because the period of observation was not sufficiently long. It is obvious that several years must elapse before a definite evaluation of the method can be made in terms of final results.

Continuation of the work for at least one additional year has been arranged for at the University of Minnesota Hospital and the Minneapolis General Hospital. It is hoped that a more complete report will be forthcoming at the expiration of that time.

It is, of course, recognized that spontaneous recovery may occur in cases of infantile paralysis without treatment of any kind. However, no accurate statistical studies of the incidence of spontaneous recovery have come to our attention.

Regardless of one's attitude toward the concept of infantile paralysis here presented, the fact remains that the currently accepted methods of treatment of the disease are far from satisfactory. The mere existence of The National Foundation for Infantile Paralysis, Incorporated, supported as it is by contributions from the entire nation, is prima facie evidence of the widespread recognition of the inadequacy of present methods of treatment.

For this reason the authors believe that the "Sister Kenny Method" should be given a fair trial and should be studied with open minds in the hope that improvement in the treatment of infantile paralysis might result.

There have been published to our knowledge four previous reports on the "Kenny method." These are:

I. The report of the Queensland commission, which condemns the method completely in every detail (*M. J. Australia* 1: [Jan. 29] 1938; summary of findings, *Brit. M. J.* 1:350 [Feb. 12] 1938).

II. The Carshalton report of the London County Council, which is summarized as follows (*Brit. M. J.* 2:852 [Oct. 22] 1938):

"1. We have seen no reason to admit Miss Kenny's claim that complete cure can be promised in any group of cases of poliomyelitis.

"2. We consider that the use of hydrotherapy in the form of hot and cold douches as practiced by Miss Kenny is of value.

"3. We consider that very early attempts to initiate voluntary movements and also early and frequent passive movements are harmless but of unproved value.

"4. We agree with Miss Kenny that under certain conditions, which we have specified, splints can be dispensed with in the treatment of the early stages of the disease. We do not approve, however, of her entire abolition of splints and surgical appliances in treatment. . . ."

"5. We consider that Miss Kenny has not really faced the issue of residual paralysis, for which we believe surgical appliances or surgical methods such as stabilizing operations offer the only eventful hope of amelioration."

From the Departments of Orthopedic Surgery and Physical Therapy, University of Minnesota Medical School.

This work has been supported in part by a grant from the National Foundation for Infantile Paralysis.

III. The report of W. R. Forster and E. E. Price, in which the conclusions are briefly as follows (*M. J. Australia* 1:321 [Feb. 25] 1939):

"So far as this investigation goes it would appear that, excluding the quoted unsatisfactory cases, return of muscle power is comparable to that obtained by orthodox methods. Pain on movement and stiffness rapidly diminish and are never so marked as in the splinted cases. The tendency to deformity has given us less trouble than in cases with ill-fitting splints. . . . Correct splinting is an advantage for many cases of paralysis of the hand, foot, and abdomen, and may be regarded as an essential for home treatment and unruly cases.

"We are of the opinion that Miss Kenny has made a definite contribution to the treatment of poliomyelitis.

"1. She has provoked a critical and in several respects beneficial review of the treatment of poliomyelitis in general.

"2. She has drawn attention to the evils of improper splinting.

"3. She has contributed to the knowledge on the subject of stiffness and has emphasized the value, in this respect, of full and more frequent movements, beginning as early as the third week."

IV. The report to the Minister for Health of New South Wales by Kenneth W. Starr in May 1939. A few of his conclusions are:

"1. Sister Kenny has made valuable contributions (a) to our knowledge of the causes of stiffness in paralyzed muscles and of its prevention and (b) regarding the results, so commonly seen, of improper splinting.

"2. Sister Kenny has made no fresh contribution to the treatment of the disease as it affects the spinal cord.

"3. Sister Kenny's contributions deal with the problem of circulation in paralyzed muscles and should bring infantile paralysis into line with modern advances in the treatment of fractures and other orthopedic conditions in which muscle stiffness has now been largely eliminated.

"4. Sister Kenny has regimented various orthodox methods, and in some aspects improved on them. Her criticism of dilatory application of reeducation to paralyzed muscles in favor of routine splinting is justified.

"5. However, the criticism leveled by Sister Kenny at orthodox methods is certainly not entirely justified, as in certain valuable respects these methods are superior to her own.

"6. Her method cannot replace orthodox practices but its most favorable principles should be incorporated in units for the treatment of infantile paralysis."

The authors of the present article consider it significant that the tone of these reports becomes more favorable the earlier the cases come under treatment. The Queensland commission reported on late cases (treatment begun over six months after the onset of the disease). The Carshalton cases were called "early" if treatment was started within eight weeks. Forster and Price reported on cases coming under treatment "as early as the third week." Treatment in 52 of Starr's cases was begun between the fifth to the twelfth day after onset of the disease.

In a number of the cases included in the present report treatment was started as early as the second day of the disease. A case was considered "late" if treatment was started later than two weeks after the onset of the disease.

SUBCOMMITTEE OF THE AFTER-EFFECTS  
COMMITTEE OF THE NATIONAL FOUNDATION  
FOR INFANTILE PARALYSIS,  
INC. M. E. KNAPP, M.D., Chairman  
in the absence of WALLACE H. COLE,  
M.D.

FRANK H. KRUSEN, M.D.

IRVINE MCQUARRIE, M.D.

For about six months, June to December 1940, we have observed and assisted in the treatment of infantile paralysis according to a method devised and developed in Australia by Sister Elizabeth Kenny. This treat-

ment has been carried on at the Minneapolis General Hospital and the University Hospital under the direct control and supervision of the orthopedic and physical therapy departments of the University of Minnesota. The actual treatment has been carried out by Miss Kenny herself with the assistance of the physical therapy and nursing staffs of these hospitals.

Miss Kenny has presented ideas which are new in the symptomatology and treatment of infantile paralysis. The technic is essentially a highly refined and detailed method of muscle reeducation. Results have been obtained in the cases of acute involvement which seem superior to those secured with therapeutic procedures previously generally accepted. One may not invariably agree with her explanations, but the results seem significant.

This preliminary report merely outlines the fundamental principles on which the therapy is based, presents briefly the technic and summarizes the progress of the patients thus far treated during the acute stage of the disease. Definite conclusions cannot yet be drawn. A continuation of the work may permit a more conclusive report in the future.

The Kenny treatment was developed in the Australian Bush through careful observations of the symptoms, signs and end results of infantile paralysis and its treatment. Miss Kenny had a keen, analytical mind unprejudiced by previous contact with theory or training in the prevalent conception of treatment of this disease. She was furthermore without knowledge of postmortem pathologic appearances. She was, in addition, thrown entirely on her own resources.

According to her concept, the cardinal symptoms of infantile paralysis are "muscle spasm," "muscle incoordination" and "mental alienation." This is opposed to the usual concept in which the cardinal symptom is conceived to be flaccid paralysis without muscle spasm or incoordination. The presence of spasm has been demonstrated in all cases of acute involvement observed in this study.

She believes that "muscle spasm" is a constant accompaniment of the muscular pain of acute anterior poliomyelitis and it may be the real and sole cause of the pain. It may also be a rational explanation for the rigidity of the neck and the back, which is usually dismissed with the term "meningeal irritation."

This spasm can be released effectively by the use of hot fomentations of the special type described later under "Treatment," and by this method the stage of muscle soreness can usually be shortened to three or four days. Sister Kenny contends that much of the permanent paralysis may be prevented, or at least reduced, by relief of this spasm as quickly and as completely as possible, for persistent muscle spasm may result in paralysis or muscle weakness in four ways:

1. The lesion which causes paralysis may so weaken a muscle that its fibers are irreversibly damaged by the added insult of prolonged muscle spasm which results eventually in the muscle becoming a hard, inelastic mass which has lost its essential power of contractility. This type of muscle in spite of all treatment will never recover and eventually results in the formation of contractures. 2. Muscle spasm in one group of muscles may result in overstretching of the opposing group so that a disuse atrophy or paralysis is produced in this

opposing muscle group although it is not directly affected by the disease. This apparent paralysis can be frequently cured within a few hours or days if adequate treatment is given to the muscles in spasm. 3. The severe pain resulting from attempts at motion when muscles are in active spasm may cause a subconscious alienation of the mental processes so that it becomes impossible to use these muscles consciously even months after the spasm has ceased. This must be treated by reeducation designed to reestablish "mental awareness" of the part after release of the spasm has been accomplished. 4. Pseudoparalysis may be produced by spasms so strong that other muscles are put at a mechanical disadvantage and therefore may appear paralyzed. Release of the spasm in these cases restores function.

Attempts of the patient to perform acts with weakened, paralyzed or painfully spastic muscles result in the substitution of other muscle groups so that a mental pathway is diverted to the wrong muscle. This results in "muscle incoordination." For instance, the patient may attempt to abduct the arm by contracting the pectoralis major, and this erroneous pathway may persist after the acute phase of the disease has passed and result in a wrong diagnosis of paralysis of the deltoid. Incoordination is treated by preventing all attempts to use painful and weak muscles except under careful supervision and direction and by restoration of coordination by proper muscle training. The latter is often a long and tedious procedure. Obviously in this treatment there is no place for "muscle testing" as usually performed—that is, attempting to determine the strength of each individual muscle—for this testing can definitely cause "incoordination" and may slow down the patient's recovery.

By "mental alienation" is meant the destruction or distortion of mental pathways so that a muscle is divorced from voluntary action. This may be a result of the fear of pain or it may be due to the disruption of conduction pathways or synapses by the disease itself through edema, hemorrhage or other pathologic process.

Mental alienation may be prevented to a greater or less degree by relief of pain and muscle spasm as quickly as possible. Treatment consists of very exact and persistent reeducation started at the earliest possible moment.

A treatment based on the foregoing principles obviously has no place for the use of splints or plaster of paris fixation. Miss Kenny lists the reasons for condemnation of the principles of immobilization as follows:

1. Immobilization prevents the treatment of the disease—that is, the symptoms of the disease—in the acute stage.
2. It prolongs the condition of muscle spasm and prevents its treatment.
3. It prevents the treatment for the restoration of coordination of muscle action, a serious error.
4. It promotes the condition of stiffness, which according to all reports prevents satisfactory treatment either for the symptoms that brought about the condition (muscle spasm) or the development of muscle power by reeducation, or the reawakening of impulse.
5. It interferes with nutrition of the skin, subcutaneous tissue and muscles.
6. It reduces circulation.

7. In any system of treatment it cannot prevent deformities. If introduced into the Kenny system it would not prevent deformity because it would prevent the treatment of the symptoms of the disease in the acute stage. It does not in the orthodox system prevent deformities, of which there is unfortunately abundant evidence.

8. It diminishes the volume of nerve impulses through the nervous system along the afferent and efferent paths.

9. It produces changes in the capsular ligaments and prevents their normal functioning.

10. It interferes with the normal function of the subconscious mind.

11. The synovial fluid tends to disappear and the joint to become dry.

12. It gives the patient an adverse psychologic outlook.

In this system the goal is coordinated, balanced function which is obtained by reestablishment of nerve pathways and mental processes, and minor importance is assigned to strength.

#### TREATMENT

A brief discussion of the usual treatment procedure may be instructive at this point. Sister Kenny states the purpose of the Kenny system as:

1. The treatment for the symptoms presenting themselves in the acute stage of the disease.
2. Maintenance in full vitality or maintenance of the healthy conditions of all tissues of the body, affected parts as well as unaffected, both somatic and visceral.
3. Reestablishment of normal nerve conduction paths and of normal function to the affected parts to the fullest extent possible.
4. Avoidance of all measures known to interfere with the attainment of these objectives.
5. Prevention of undesirable sequelae and complications.

The technic is roughly the following for a patient admitted within a day or two after the diagnosis has been made:

Especial attention is paid in the examination to the presence of muscle spasm, the location of pain and the extent and probable cause of apparent paralysis, and the patient is then placed on a firm mattress supported by bed boards. There is a foot board with the mattress sufficiently separated from it so that the heels or toes of the patient will not be resting against the mattress. This board is intended to maintain the normal standing reflexes arising from pressure of a hard surface on the soles of the feet and is in no way to be considered a splint.

The patient is placed in a position comparable to the normal standing position, with the arms at the side and the knees straight. No splints or casts are used. Hot fomentations are then applied to the affected muscles. These fomentations are made with boiling water from pieces of blanket cut to size which are passed twice through a very tight wringer and applied directly to the part. The joints are not covered and no cutaneous irritation occurs. These fomentations are renewed every two hours in most cases, every hour or half hour in cases of more serious involvement. Passive movements through the range of motion possible without pain are carried out several times a day. In addition an attempt is made to maintain awareness of the part by training once or twice a day as soon as muscle spasm is sufficiently reduced. As the pain is reduced the muscle training is increased to maintain normal nerve pathways and

restore those which are damaged. By the time the patient is ready to be released from the contagious ward the pain and spasm are usually gone and the reeducation has been well started. Periods of muscle training are carried on twice a day until the patient is normal or ready to be discharged from treatment.

The technic of reeducation of the muscles cannot be fully presented in this short paper. The principles are the establishment of awareness by pointing out the insertion of the affected muscle, then having the patient make a mental effort while the technician carries out the motion and finally having the patient make a physical effort. This procedure is repeated twice every day until the patient has useful function of the part, but only one to three active movements are ever allowed. Great care is taken to center all attention on the part being treated and to avoid overtiring the patient either physically or mentally. Meticulous attention is paid to body mechanics and exact muscle function. The details of this method of treatment cannot be learned quickly. The longer we have observed Miss Kenny's work the more we have realized that there is a reason for the two year period of training which her pupils receive in Australia.

The complete technic will no doubt be published in book form some time in the future.

#### REPORT OF CASES

To date 26 patients with acute anterior poliomyelitis have been treated under our observation by this method. Twenty received the Kenny treatment within two weeks after the onset of the disease. Eleven have already been discharged completely normal. The average hospital stay of these patients was thirty-six and two-tenths days. Of the remaining 9, 1 has paralysis of both legs which will probably be permanent. One was admitted only three weeks before the date of writing.

The other 7 are progressing satisfactorily, but it will take time to establish the extent of their final recovery.

In this series 11 of 20 patients are normal within two months after the onset. It is expected that at least 5 of the others will recover completely within a reasonably short period of time.

Of the 6 patients on whom the Kenny treatment was started from two weeks to two months after the onset of the disease, 2 have been discharged as completely well, 1 will probably have permanent paralysis of one arm and 2 are quite likely to have some degree of permanent paralysis. This would seem to indicate that early treatment may have some value in preventing the development of severe disabilities.

#### COMMENT

It is impossible at this time to attempt to evaluate end results or to do more than indicate impressions. Epidemics vary in their severity from year to year, and the percentage of the hospitalized patients who would have recovered completely under the usual therapy cannot be accurately estimated.

The patients observed were much more comfortable and cheerful during the acute stage than are those who are immobilized. Thus far, we have seen no contractions or deformities following this treatment. Even the most severely paralyzed patient has passively full range of motion in all his joints. Scoliosis or other spinal deformity has not developed in these cases. In

most of them there is more flexibility than there was before the onset of the disease. The patients are more comfortable and more cheerful, and it appears that the disability is less severe than would have been expected ordinarily. Certainly harm has not resulted to any of the observed patients under Miss Kenny's care from "abandonment of immobilization."

## CROSS INFECTION WITH TYPE I PNEUMOCOCCUS

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AND

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That pneumococcal pneumonia is a contagious disease and that isolation procedures are necessary in the care of patients suffering from it have been emphasized by certain clinicians.<sup>1</sup> Smillie and Leeder<sup>2</sup> observed that 2 per cent of patients in contact with patients with pneumonia contracted pneumonia. In the report by Benjamin, Ruegsegger and Senior<sup>3</sup> it was stated that 13 cases of pneumococcal pneumonia which were obviously due to cross infection occurred in the years 1936 and 1937 at the Cincinnati General Hospital and that during the following winter when isolation technic was enforced only two such instances of cross infection occurred.

Smillie<sup>4</sup> has shown that type I pneumococcus is twenty times more prevalent in persons exposed to this strain than in the population at large. He stated, furthermore, that economic status and overcrowding play no role in increasing the number of positive contacts. The study of Benjamin, Ruegsegger and Senior,<sup>3</sup> however, emphasized the influence of overcrowded hospital wards in the production of cross infection with pneumococci.

The following nine instances of cross infection with type I pneumococcus occurred in November and December of 1939 during a period of two weeks in the pediatric service of the Cincinnati General Hospital. All the children, with one exception, were between the ages of 2 and 3 years. It has been the practice to admit patients with pneumonia in this service to one large ward in which all patients are isolated and mask and gown technic is enforced. Because of the number of admissions, it is necessary at times to remove these patients during their convalescence to smaller wards in which isolation technic is not enforced.

Of the 9 patients 5 (1 to 5, inclusive) when admitted were suffering from bronchopneumonia and 1 (patient 6) from bronchitis and otitis media. The 3 remaining patients were not in the large ward at the time of admission of the other patients but were in small nearby wards. Patient 7 was suffering from pyelitis, patient 8 had nephritis and patient 9 was convalescing from a hernia operation.

Dr. Mitchell died June 1.

From the Cincinnati General Hospital, the Children's Hospital Research Foundation and the Craig-Weiser Pneumonia Laboratory.

1. Sulkin, S. E.: *Epidemiology of Pneumonia*, J. Missouri M. A. 37: 280-283 (July) 1940. Smillie and Leeder.<sup>2</sup> Benjamin, Ruegsegger and Senior.<sup>3</sup> Smillie.<sup>4</sup>

2. Smillie, W. G., and Leeder, F. S.: *Epidemiology of Lobar Pneumonia*, Am. J. Pub. Health 24: 129-138 (Feb.) 1934.

3. Benjamin, J. M., Ruegsegger, J. M., and Senior, F. A.: *Cross Infection in Pneumonia*, J. A. M. A. 112: 1127-1130 (Oct. 21) 1933.

4. Smillie, W. G.: *Epidemiology of Lobar Pneumonia*, J. A. M. A. 101: 1281-1286 (Oct. 21) 1933.



Pneumococci isolated on admission by culture and mouse inoculation of material from the noses and throats of patients are recorded in the accompanying table, and it will be noted that in no instance was the type I pneumococcus present at that time. Patients 1 to 6 were given sulfapyridine therapy at the time of admission, the level of free sulfapyridine in the blood being maintained in all of them at 4 mg. per hundred cubic centimeters or higher. They responded well to the drug, and their temperatures returned to normal on the second to the third day after admission. In all 6 patients, however, after a normal temperature for from four to five days, fever suddenly developed and signs of further pulmonary infiltration were obtained on physical examination and confirmed by roentgenograms. With this secondary rise in temperature type I pneumococcus was obtained from the nose, throat, ear or blood as shown in the accompanying table. Patients 1 and 5 experienced

of temperature when type I pneumococcus was isolated. Patient 7, however, merely had an elevation of temperature which lasted twenty-four hours and subsided without treatment.

Healthy carriers were apparently not the cause of these infections, since inoculation of mice with cultures of material from the nose and throat of all nurses, physicians, orderlies and maids working in the wards failed to recover type I pneumococcus.

During convalescence of the 9 patients cultures of material from the nose and throat were repeatedly taken. Fourteen days after the initial isolation of type I pneumococcus from these patients cultures of material from the nose and throat of 4 were negative for the organism, and by forty-two days those from all patients were negative. Convalescence in every case was uneventful.

The nine instances of cross infection with type I pneumococcus cited emphasize the necessity for strict

*Cross Infection with Type I Pneumococcus: Clinical Summary*

Case	Diagnosis on Admission	Culture of Material from Nose and Throat on Admission	Chemotherapy	Day After Admission on Which Temperature Was Normal	Day on Which Treatment Was Discontinued	Day on Which Secondary Rise in Temperature Occurred and Type I Pneumococcus Was Found	Source of Type I Pneumococcus	Respiratory Involvement with Type I Pneumococcus Infection
1	Bronchopneumonia	Pneumococcus type XIX	Sulfapyridine	Second	Ninth	Sixth	Nose and throat	Pneumonia, lower lobe of left lung; bilateral bronchopneumonia
2	Bilateral bronchopneumonia	Pneumococcus type VI	Sulfapyridine	Second	Fifth	Seventh	Nose, throat and blood	Bilateral bronchopneumonia with spread
3	Bronchopneumonia, left lung	No pneumococci	Sulfapyridine	Second	Fourth	Ninth	Nose and throat	Bronchopneumonia with spread
4	Bilateral bronchopneumonia	Pneumococcus type VI	Sulfapyridine	Second	Eighth	Ninth	Nose and throat	Bronchopneumonia with spread
5	Bronchopneumonia, right lung	Pneumococcus types XIII and XVI	Sulfapyridine	Third	Seventh	Seventh	Nose, throat and blood	Bronchopneumonia in right lung, with spread
6	Bronchitis, otitis media	No pneumococci	Sulfapyridine	Second	Sixth	Seventh	Nose, throat and blood	Pneumonia, lower lobe of left lung
7	Pyelitis	.....	Sulfanilamide	Ninth	Eleventh	Twelfth	Nose and throat	Pharyngitis
8	Nephritis	.....	.....	.....	.....	Twenty-eighth	Nose, throat and blood	Bilateral bronchopneumonia
9	Hernioplasty	.....	.....	.....	.....	Twentieth	Nose and throat	Pneumonia, lower lobe of left lung

the secondary rise in temperature while still receiving sulfapyridine. This rise occurred one day after the drug had been discontinued in patients 4 and 6, while in patient 2 it occurred after two days. In patient 3 the rise did not occur until five days after chemotherapy was discontinued.

Patients 7, 8 and 9 were exposed to infection with type I pneumococcus when patients 1 to 6 were removed during their convalescence to the smaller wards. Patient 7, who was suffering from pyelitis, had been in the ward twelve days prior to the rise in temperature which accompanied his infection with type I pneumococcus. Similarly, patient 8, who was suffering from nephritis, had been in the ward twenty-eight days, and patient 9 had been in the ward for twenty days after an operation for hernia. These 3 patients showed no evidence of infection of the respiratory tract on admission, and cultures of material from the nose and throat which yielded type I pneumococcus were taken because of the suspicion that the infection was spreading in the ward.

Roentgenograms of all patients, with the exception of patient 7, showed either pulmonary infiltration or increase in previous infiltration at the time of the rise

isolation technic in the care of patients with pneumococcal pneumonia. From our experience and from the results of previous studies it would appear that precautions regarding isolation should not be terminated when the patient is apparently convalescent but should be continued until his discharge from the hospital or until such time as repeated cultures of material from the nose and throat are negative for pneumococci.

**First Laboratory of Experimental Psychology.**—Wilhelm Wundt (1832-1920), the famous professor of physiology, while at Zurich was interested in reflex actions and other neural mechanisms, into which he attempted to translate a large proportion of human behavior. His isotonic curves representing muscle tissue under constant excitation have been the starting point for many research problems throughout the years. His well known classic, *Elements of Physiological Psychology*, has been extended through six editions. He established in 1876 the first laboratory of experimental psychology, which became the model for many later ones. The second laboratory of this kind was organized in 1883 by G. Stanley Hall (1846-1924) at Johns Hopkins University.—Lewis, Nolan D. C.: *A Short History of Psychiatric Achievement*, New York, W. W. Norton & Co., Inc., 1941.

## THE USE OF SURFACE ANESTHESIA IN THE TREATMENT OF PAINFUL MOTION

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This paper describes a method of treatment for impaired function when pain is the factor responsible for the loss of motion or power. The treatment is the application of a surface anesthetic (ethyl chloride spray) combined with active motion.

### DEVELOPMENT OF THE TREATMENT

In 1933 a gymnastic teacher—Heinz Kowalsky—suggested that treatment of sprains and pulled muscles by immobilization was not satisfactory to active sportsmen. He said that professional sportsmen had found by experience that immediate active motion after any such injury provided the quickest cure. He further told me that he usually advised his pupils to rub their injured joints with alcohol and expose them to live steam for a time. Numbness of the joint was said to result, and active motion was started as soon as this numbness set in. The result of this treatment was said to be satisfactory and superior to treatment by immobilization.

I tried the treatment in a few cases of minor sprain with success, but in cases of severe involvement when the patient lacked energy to undergo this prolonged and unpleasant procedure it failed. I then tried other readily evaporating liquids and finally adopted ethyl chloride, which has been used with success. At first only sprains were treated; later, acute muscular spasms due to conditions such as lumbago and acute bursitis of the shoulder as well as muscular spasm accompanying various chronic conditions, such as sciatica, low back pain and pain recurring after old injuries.

The use of active motion is an essential part of the treatment. With more experience in the proper use of active motion, better results were obtained. The experience thus gained has been published (1935 to 1938) in various papers.<sup>1</sup> Other authors (Creer,<sup>2</sup> Cozen and Hollombe<sup>3</sup>) published their experiences with ethyl chloride spray in 1939 and 1940.

### INDICATIONS FOR USE

Experiences recently gained in the fracture division of the Presbyterian Hospital have confirmed previous observations. Though further research will be necessary for final conclusions, the following groups of cases are considered suitable for treatment by surface anesthesia and active motion, if major disturbance of the normal anatomy, such as fractures or a complete tearing of ligaments, muscles or tendons of the affected region are absent: (1) sprains of all joints; (2) acute muscular spasm due to lumbago, acute bursitis of the shoulder, pulled muscles, and so on, and (3) chronic muscular spasm due to "low back pain," sciatica, chronic osteoarthritis, shoulder spasm and the like.

From the Fracture Service of the Presbyterian Hospital.

1. Kraus, Hans: *Ausbau funktioneller Behandlung Unfallverletzter mit Hilfe aktiver Gymnastik*, Wien. klin. Wchnschr. 46: 594 (May 12) 1933; *New Treatment for Injured Joints*, abstr. J. A. M. A. 104: 1261 (April 6) 1935; *Neue Distorsionsbehandlung*, Wien. klin. Wchnschr. 48: 1014 (Aug. 9) 1935; *Mitt. d. Volksgesundhsamt.*, 1936, no. 4; *Behandlung acuter Muskelhärtungen*, Wien. klin. Wchnschr. 50: 1356 (Oct. 1) 1937; *Behandlung chronischer schmerzreflektirischer Muskelhärtungen*, Wien. med. Wchnschr. 88: 294 (March 12) 1938.

2. Creer, W. S.: *Physiotherapy and Orthopedics*, Brit. J. Phys. Med. 2: 50, 1939.

3. Cozen, Lewis, and Hollombe, B. S.: *Ethyl Chloride Spray for Sprained Ankles*, Surgery 8: 468 (Sept.) 1940.

The common symptom treated in these conditions is limitation of motion through pain and subsequent spasm. Major changes in anatomy, such as fractures or tears of soft parts, are treated by the usual surgical methods. Whenever treatment with ethyl chloride spray gives a negative result, it will be necessary to look for major changes in the anatomy. Thus this technic may be used as a means of evaluating diagnosis in cases of impaired function.

### TECHNIC

The painful region must be determined through active motion. The direction in which the motion is impaired is first determined. Then ethyl chloride is sprayed on this area of skin. The patient then starts careful active motion of the part involved, in the direction in which the motion has been painful and limited. As the patient carefully increases the movement, new painful areas—which up to this point have been hidden through blocked motion—will develop. Those areas again have to be sprayed and active motion continued.

These treatments last from ten to thirty minutes and should be performed carefully and well within the limits of pain. Immediately after the treatment, camphor liniment should be applied to the skin, to avoid frostbite.

Immediate normal use of the affected part can be allowed in a majority of cases, but excessive strain and sudden movement should be prohibited. Patients with more severe disorders should be given a rest, but all patients should be advised to continue the active movements taught them—from twice a day to once every hour—for approximately five minutes. While a single treatment will be sufficient in cases of minor involvement, patients with more severe involvement will have to be treated several times: the first week, daily—later, every other day.

An effective treatment, however, should not call for the anesthetic after the second week, whereas active motion will have to continue until normal muscular power is restored.

Immobilization after treatment is contrary to the basic principle and should, therefore, never be combined with it.

### RISKS IN THIS TREATMENT

Excessive use of ethyl chloride spray may result in frostbite of the skin. To prevent this, camphor liniment or other counterirritants should always be used.

I have used a spray composed of ethyl chloride with camphor liniment and compounds of ethyl chloride with various oils with good success. These oils, mixed with the ethyl chloride and thus used in proportion, provide an immediate antidote against irritation of the skin.

A mixture of ether, alcohol, acetone (of each 100 parts) and camphor liniment (20 parts) applied after the spraying, has been found helpful in aiding the effect of ethyl chloride and in acting as a counterirritant at the same time.

Active motion, though absolutely necessary, should never be used brusquely or abruptly, in order to avoid injuries to the spastic muscles, which would obviate the effect of the exercise.

As previously emphasized, normal anatomy must be present if this treatment is to be used effectively. Whenever this point is neglected, treatment with ethyl chloride either has no effect or, as with any other treatment when wrongly applied, will cause damage.

## RESULTS

In acute attacks the effect of the treatment is amazing. Patients who have been disabled by acute sprains or acute muscular spasm often regain the full use of the affected parts immediately. The pain frequently does not recur in cases of minor involvement and rarely recurs in full intensity in those of more serious involvement. Two to four treatments usually suffice to bring about, even in more serious cases, a minimum degree of discomfort. Thus, in all cases the period of disability is reduced drastically. Atrophy of the muscles involved does not develop to the same degree as when immobilization is employed. Swelling is more readily absorbed. Patients treated by this method are less apt to sustain the same injury again than those treated by immobilization. The same holds true for chronic and "rheumatic" conditions, although a longer period of treatment is usually required in those cases.

As a means of aiding in diagnosis and in the evaluation of roentgenograms, this treatment is of great value. Further analysis and experience will be needed to establish general rules.

As compared with the injection of procaine hydrochloride into the muscles and ligaments (Leriche<sup>4</sup>), this method shows the following advantages:

1. Application is simpler.
2. Repeated application is possible, with less difficulty and risk.
3. Large areas can be controlled which otherwise would call for the use of vast quantities of procaine hydrochloride.
4. It does not work when fractures or tears are present; thus it is less dangerous and more selective.
5. It is more advantageous in its use as a diagnostic means, being more selective.
6. There is less risk of a local after-effect and no general after-effect such as is sometimes seen after the administration of procaine hydrochloride.
7. There is no danger of infection.

## THEORY

Payr<sup>5</sup> described the "chain effect of painful muscle spasm." He described how pain, originating in one portion of the sensory motor chain, leads to reflex muscular spasm and locking of joints. This chain consists of the following elements: sensory nerve, nerve center, motoric nerve, muscle and sensory nerve. Pain originating in the course of this chain leads to muscular spasm. The spasm is in itself painful and leads to more spasm. Elimination of pain at any point of the chain results in the breaking of the chain and therefore in relaxation of the muscular spasm. This may be achieved directly by the injection of an anesthetic into the muscle, joint, ligament, sensory nerve or spinal cord.

If the pain-free interval is used to restore the muscle to normal function, the spasm does not recur or recurs with much less intensity. Empirically, on the basis of this chain, cutaneous anesthesia similarly relieves the deep-seated pain in muscular spasm.

I have no explanation to offer as to how this deep effect of surface anesthesia works. It seems to be a fact, but the underlying physiologic explanation presents an interesting field for exploration. It must be definitely understood that in no case will the ethyl chloride alone, without active motion, achieve good results.

4. Leriche, René: Qu'est-ce qu'une entorse? *Gaz. d. hôp.* **107**: 325 (March 7) 1934.

5. Payr, Erwin: *Gelenksteifen und Gelenkplastiken*, Berlin, Julius Springer, 1934.

The considerable shortening of the period of treatment and the early rehabilitation with restoration of normal function make it desirable that this treatment should find general application. This is true especially in athletic injuries and injuries occurring to laborers and to those in the military service.

36 Central Park South.

## Clinical Notes, Suggestions and New Instruments

### VENTRICULAR FIBRILLATION CAUSING SUDDEN DEATH OF A PATIENT WITH DISEASE OF THE LEFT CORONARY ARTERY

IVAN THOMPSON, M.D., OGDEN, UTAH

In recent months there have been several articles published dealing with various phases of the terminal cardiac mechanism in patients suffering from disease of the coronary arteries. The presumption is that sudden, unexpected death both of patients with angina pectoris and of those with coronary occlusion is generally due to fibrillation of the ventricles. There is evidence, however, that in at least some such cases the terminal cardiac mechanism is ventricular standstill due to overwhelming, sudden stimulation of the vagus resulting in paralysis of the pacemaker. There have been but very few electrocardiograms recorded at the time of sudden death of patients with these conditions. Therefore but little direct evidence is available as to the exact terminal cardiac mechanism.

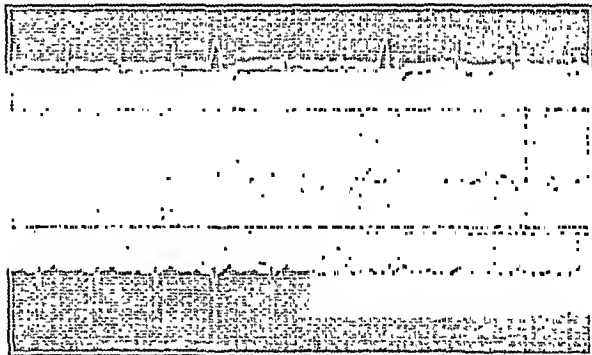


Fig. 1.—Standard leads: The PR interval is at the upper limit of normal, measuring 0.2 second, while the QRS interval is approximately 0.08 second. Lead 1 shows two premature beats apparently arising in the right ventricle, while in lead 2 a short paroxysm of ventricular tachycardia is seen. The ventricular rate during this paroxysm is variable, and the complexes are of many different shapes. The three leads taken as a whole show considerable left axis deviation with small Q waves in lead 1 and prominent Q waves in lead 2.

In a review of the literature on this subject in 1939, Smith<sup>1</sup> found 4 published instances of electrocardiograms showing ventricular fibrillations causing sudden, unexpected death. To the list he added a fifth case, this being the first recorded of a person who had had an acute coronary thrombosis just a few hours previously.

In November 1940 Goodrich<sup>2</sup> reported the unusual experience of observing in one afternoon the terminal cardiac mechanism in 2 instances of sudden death from disease of the coronary arteries. In 1 case cardiac standstill developed after a period of ventricular tachycardia; in the second ventricular fibrillation occurred during the period of terminal cardiac activity. Goodrich pointed out that the first patient, dying after cardiac standstill, offered further support to the contention of Grieco and Schwartz, who in 1938 first demonstrated that ventricular standstill might be the cause of death after acute coronary thrombosis. Goodrich's second case, in which the terminal car-

1. Smith, F. J.: Ventricular Fibrillation as a Cause of Sudden Death in Coronary Artery Thrombosis. *Am. Heart J.* **17**: 735 (June) 1939.

2. Goodrich, H. E., and Needles, R. J.: Terminal Cardiac Mechanism in Coronary Artery Disease. *Am. Heart J.* **20**: 637 (Nov.) 1940.

# VENTRICULAR FIBRILLATION—THOMPSON

Jour. A. M. A.  
JUNE 7, 1941

diac mechanism was ventricular fibrillation, was the sixth proved instance of this type to be reported. My purpose in this report is to add the seventh instance of proved ventricular fibrillation occurring as the terminal cardiac action in a case of disease of a coronary artery. There have been numerous patients who have recovered from occlusion of a coronary artery and then months or years later have died suddenly, unexpectedly and without warning. The case about to be reported was such. As chance would have it, an electrocardiograph was connected to the patient at the moment death so suddenly and unexpectedly occurred.

## REPORT OF CASE

F. W. A., a white man aged 66, for many years an employee of a railroad in the commissary department, had been seen three or four times a year over a period of thirteen years for periodic examinations, as insisted on by his employer. The reason for

On the morning of the seventh day after leaving the hospital, while still in bed, he was seized with a severe substernal pain which radiated to both shoulders and arms and which was accompanied by extreme shock. He was hospitalized immediately. The picture at the time and the subsequent course were typical of coronary occlusion; however, no electrocardiograms were obtained. He gradually improved, finally being discharged from the hospital eleven weeks later. On discharge from the hospital he was entirely free from pain, was in good spirits and was ambulatory. He remained quietly at home for the next six weeks, although he was able to take short walks each day. Seventeen weeks after the coronary accident he went to California for a visit but finding himself dissatisfied there returned home after about three weeks. After returning he complained of some mild substernal pain on moderate exertion and became apprehensive and depressed. He was easily fatigued and also experienced palpitation at times.

Because of these symptoms I was asked to examine the patient and obtain an electrocardiogram. I called at the patient's home about noon on Feb. 2, 1940, which was about twenty-three weeks after the coronary accident. He met me at the door fully dressed and apparently in the best of spirits. We conversed for about fifteen minutes while the electrocardiograph was being arranged and the electrodes connected. The patient remarked during this preparation that he had felt considerably better for the past several days. From all outward indications he seemed to be perfectly well. The three standard leads were then taken. While lead 2 was being recorded the string in the view box was noted to be acting wildly, but after a relatively brief period it settled down and leads 2 and 3 were completed without incident.

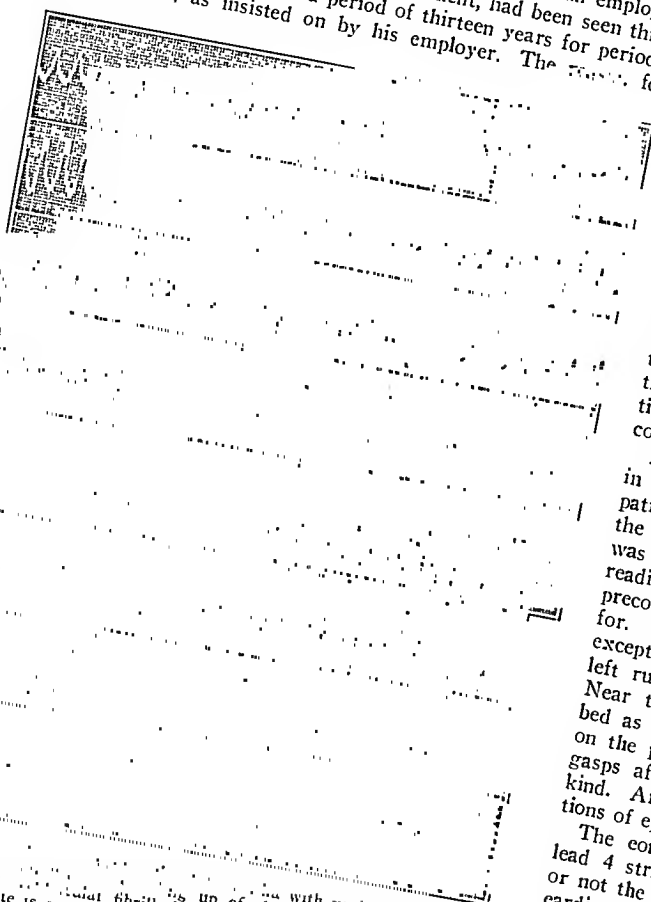
It took approximately two minutes to change the connection in preparation for the chest lead, and during this interval the patient related an interesting experience he had had. When the recording of the chest lead was started the string again was noted to be wild in its action. The radial pulse was not readily palpable. On my placing a stethoscope over the patient's precordium the wild action of the string was readily accounted for. When asked if he was feeling all right he stated that except for a sense of palpitation he felt fine. The record was left running for a total of two minutes and twelve seconds. Near the end of the period the patient rose halfway up in bed as a result of a convulsive movement and then fell back on the pillow obviously dead. He did give one or two slight gasps afterward, but there were no other movements of any kind. Artificial respiration, stimulants and intracardial injections of epinephrine were given, with no response whatever. The convulsive movement is recorded near the end of the lead 4 strip by the string wavering over the film. Whether or not the last heart beat is recorded is doubtful. The electrocardiograph was turned off four fifths of a second after the last deflection of the string; however, in the confusion resulting from the unusual turn of events, one of the electrodes may have been unwittingly disconnected. It seems apparent that the string should have been photographed on the remaining strip as a straight line if no cardiac action was occurring rather than being abruptly terminated as the tracing shows. This point is of relatively small importance, however.

An autopsy was performed by Dr. G. W. Schelm. The cardiac changes alone were of importance. The heart weighed 445 Gm. There were multiple areas of healed infarction over the lateral and posterior surfaces of the left ventricle. The coronary vessels were dissected out completely. The right vessel and its branches were found patent throughout, and the wall of the vessel showed only an occasional patch of atherosclerosis. The left coronary artery was tortuous and greatly thickened. The lumen was completely or nearly completely obliterated in several places. The vessel had been completely occluded 2.5 cm. from its ostium, and recanalization through the obstruction had subsequently occurred. There was no evidence of a fresh thrombosis.

As shown by autopsy, this patient had had an old coronary occlusion with healed myocardial infarction which apparently had occurred six months before. He had recovered sufficiently from this so that he was ambulatory, although his condition

## COMMENT

these frequent check-ups was mild hypertension; the blood pressure gradually increased over the thirteen year period to a maximum of about 180 systolic and 110 diastolic. The patient had always been of the extremely nervous type, had worried a great deal and had been especially apprehensive over the fact that his company regarded his hypertension seriously enough to require a check-up every three months, although this was a policy of the company with all such employees. His health remained generally good until July 23, 1939, when he suffered a cerebral accident while on duty at a company hotel. This paralysis of the right arm and leg together with some aphasia. His blood pressure the day following the accident was 210 systolic and 130 diastolic. He was hospitalized for two weeks, during which time the partial paralysis promptly cleared up; when he was discharged from the hospital the only remaining evidence of the cerebral accident was weakness of the right arm. His blood pressure on discharge was 150 systolic and 80 diastolic.



was such that he was not able to return to work. His cardiac symptoms for the few weeks preceding his death were those of coronary insufficiency; however, the mental symptoms of nervousness, fear and depression dominated the clinical picture. Figure 1 shows the standard leads, which, although not of normal pattern, failed to reveal the imminent catastrophe. It will be noted in lead 2 that ventricular tachycardia was established for a short time but immediately reverted to normal sinus rhythm. It is possible that the attacks of palpitation complained of were due to the occurrence of ventricular tachycardia.

It is unfortunate that the lead 4 strip was not started a few seconds before, at which time it might have recorded the transition from the normal sinus rhythm to the fatal arrhythmia. Lead 4 is one continuous strip taken over an interval of two minutes and twelve seconds. It will be noted that during most of this period tachycardia of ventricular origin was present. This finally changed into ventricular fibrillation, which was the terminal cardiac mechanism.

#### SUMMARY

In the case here reported, there were present clinical features and postmortem evidence of advanced disease of the left coronary artery, thrombosis and healed infarction. Death occurred suddenly and unexpectedly because of the establishment of ventricular fibrillation. This is the seventh such case to be reported in the literature. It is the first of its particular kind recorded.

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### Special Articles

#### RECOMMENDATIONS FOR A VENEREAL DISEASE CONTROL PROGRAM

##### IN STATE AND LOCAL HEALTH DEPARTMENTS

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More than five years ago an Advisory Committee to the U. S. Public Health Service described plans for venereal disease control work in health departments throughout the United States.<sup>1</sup> Since that time a broad program of federal aid has been developed to supplement state and local facilities for the control of the venereal diseases. In the ensuing years, material progress has been made in the control of syphilis. Some advance has been made against gonorrhea, but it seems probable that the next few years will see much greater progress against this disease when full utilization is made of modern methods for its diagnosis and treatment. There has also been further accumulation of knowledge of the public health control of the venereal diseases. It therefore seems desirable at this time for the committee to reconsider former recommendations and to revise plans wherever such revisions seem to make possible a more efficient program.

The report of the committee will be divided into two parts—the first will make only broad recommendations pertaining to the control of the venereal diseases; the second (in process of publication) will describe those

Report of an Advisory Committee to the United States Public Health Service, Revised April 15, 1941.

1. Vonderlehr, R. A., and others: Venereal Disease Control Program in State and Local Health Departments. Report of an Advisory Committee to the U. S. Public Health Service, Ven. Dis. Inform. 17:1-16 (Jan.) 1936.

detailed measures which the committee considers to be the most desirable and effective parts of a good program. The general recommendations are made here.

#### ORGANIZATION AND ADMINISTRATION

Venereal disease control work should be the function of a separate division in the state or large municipal health department. Where this is impracticable, the work should be the function of a subdivision with a high degree of autonomy in the division of communicable disease control.

In either case, the program should be directed by a venereal disease control officer who has been adequately trained in the administrative aspects of this work, who gives his entire professional time to the duties of his office and who otherwise is qualified as recommended by the Surgeon General of the Public Health Service after conference with the state and territorial health officers.<sup>2</sup> This health officer should be supported by an adequate clerical staff. In health departments serving large numbers of people it may be necessary to provide additional administrative and technical personnel to assist the venereal disease control officer.

The duties of the venereal disease control officer and his staff are (1) a definition of the aims, purposes and policies of the venereal disease control program; (2) the collection and analysis of morbidity data; (3) the establishment of effective cooperation with physicians in private practice; (4) the development of cordial relations not only with the public but with special scientific groups; (5) administrative consultation to other units within the health department such as the Laboratory Section, the Maternal and Child Health Section and the Industrial Hygiene Section; (6) the organization and supervision of venereal disease clinics; (7) the organization and supervision of epidemiologic and follow-up services for clinics and private physicians, and (8) study and control of the efficiency of venereal disease clinics in terms of contact tracing, efficacious treatment and case holding, utilizing for the purpose a mechanical statistical system or some other equally effective plan.

In the organization and administration of the venereal disease control program the advice and assistance of a state or local committee should be sought. This committee should be composed of members of the medical profession and scientific and technical personnel from interested related professions, as well as representatives of business and social groups.

#### MORBIDITY REPORTS

The venereal disease control officer should be given the responsibility for the collection of adequate morbidity reports. The morbidity report form should contain as a minimum the following items:

1. Date of report.
2. Name or initials or identification number of patient.
3. Address of patient.
4. Age or birth date, color and sex of patient.
5. Duration of infection.
6. Diagnostic classification:

##### Syphilis—

Acquired: Primary. Secondary.  
Early latent (less than four years' duration).  
Late latent (four or more years' duration).  
Congenital (specify manifestations).

##### Gonorrhea—

Genital. Eye. Other.

##### Chancroid—

Granuloma inguinale.  
Venereal lymphogranuloma.

2. Proc. Conference State and Territorial Health Officers, 1939, U. S. Public Health Service.



7. Laboratory confirmation of diagnosis (dark-field, blood, smear, culture, Frei test, or intracutaneous test for chancroid, reported as positive, doubtful, negative or not done).

8. Information concerning amount of previous treatment.

9. Statement as to whether or not patient with syphilis is pregnant at time of beginning treatment (if pregnant, months pregnancy has advanced or the expected date of confinement).

In those areas in which facilities exist to provide the treatment source with contact tracing and case holding service, stubs should be included on the morbidity report form for requesting this service. Items on such stubs should be as follows:

I. Discontinued Treatment Notice.—1. Patient identification (name, address, age, color, sex). 2. Disease and date of infection. 3. Amount of treatment before lapse. 4. Date of last treatment. 5. Date and result of last laboratory report. 6. Identification of treatment source and signature of physician or administrative officer.

II. Section on the morbidity report form for epidemiologic investigation providing space for the names, addresses, relationship, and age of all familial or extrafamilial contacts within the preceding sixty days. When these data are not available for extrafamilial contacts, space should be available on the form for a brief description of each such contact.

The state health department should provide, distribute and collect morbidity reports without expense to the physician and with a minimum demand on his time. If possible, use should be made of these reports to establish incidence and prevalence data for the venereal diseases and to indicate the trend of these infections. The physician in private practice who submits the reports should be advised of the observations that are made as a result of the study of these forms.

#### LABORATORY SERVICE

Adequate and universally available laboratory service for dark field examinations and serologic tests for syphilis and for microscopic and cultural examinations for the gonococcus are essential in the control of these diseases. This laboratory service should be available without charge on the request of any licensed physician without the requirement that the patient from whom the specimen is taken be certified as to indigency.

There should be at least one state laboratory which may be supported by as many branch and local laboratories as the demand for service may require. Under certain circumstances, approved private laboratories may be subsidized instead of organizing new branch laboratories. When such private laboratories are utilized, the cost per test of performing the laboratory work should not exceed the prorated cost in the central state laboratory.

The recommendations of the Committee on Evaluation of Serodiagnostic Tests for Syphilis in the United States should be accepted as standard for the collection and transportation of specimens, the efficiency of performance of serologic tests for syphilis and the method of reporting results. A satisfactory plan for the intra-state study of efficiency of performance of serologic tests for syphilis was approved by the Committee on Evaluation of Serodiagnostic Tests for Syphilis during the Assembly of Laboratory Directors and Serologists, held at Hot Springs National Park, Ark., in the autumn of 1938.<sup>3</sup>

Every public venereal disease clinic should be equipped for direct dark field examination for the detection of *Spirochaeta pallida* as rapidly as clinic physicians or technicians can be trained in the recog-

nition of this organism. The indirect method of dark field examination is urgently needed in many parts of the country as an aid in the diagnosis of seronegative primary syphilis, but this method has not as yet been demonstrated on an extensive scale to be an effective, practical method for the detection of *Spirochaeta pallida*. Further intensive study of the indirect method is necessary not only because of its potential value to general practitioners in rural areas but also because of the dearth of physicians and technicians trained and experienced in direct dark field technic.

Every health department laboratory and clinic should be equipped for the examination of smears to detect the gonococcus. Only the Gram stain or a modification which has been approved by some competent authority in bacteriology should be used in making this microscopic examination.

Improved technics for the cultivation of the gonococcus make it important for all health department laboratories to provide this service unless some empiric chemotherapeutic scheme for the control of gonorrhea can be applied after symptomatic cure has been attained. Such cultures should also be made available in all venereal disease clinics as rapidly as circumstances will permit.

#### TREATMENT FACILITIES

*Eligibility of Patients for Medical Care by the Health Department.*—Clinic service without cost should be provided for (a) the diagnosis and emergency treatment of all persons who apply; (b) all patients referred by private physicians either for continued treatment or for consultation, and (c) all patients unable to pay for private medical care. Since the venereal diseases constitute a nationwide problem, it is essential that non-resident and transient persons be as eligible for clinic service in the community as are residents of that community. The integration of the work of various public and private agencies for the treatment of the venereal diseases is a major problem for the venereal disease control officer. To win the enthusiastic cooperation and acceptance of modern standards for the control of the venereal diseases from hospitals and groups who feel no need for public funds and have little desire to accept public guidance should be as much an objective of the campaign as to purchase such cooperation from clinics and groups eager to supply it in exchange for subventionary funds for equipment and personnel.

*Clinics.*—Clinics should be located so as to be easy of access and of maximum convenience to the population of the areas which they serve. The number of clinic sessions should be such as to meet the needs of the area without overcrowding or unreasonable delay. Night sessions should be held in sufficient number and at such hours as may be necessary to prevent economic loss to employed patients.

Clinics should be held in clean, well lighted and well ventilated rooms, so located and arranged as to offer privacy but not to imply isolation or segregation. The physical arrangements should be such as to insure complete privacy in history taking, physical examination and the administration of treatment. Adequate waiting rooms should be provided together with the necessary toilet facilities.

The equipment of the venereal disease clinic may be relatively simple if it is part of a polyclinic. If it is an *ad hoc* clinic the minimum diagnostic equipment should include an ordinary and a dark field microscope, blood pressure apparatus, stethoscope, ophthalmoscope,

3. The Serodiagnosis of Syphilis, supp. 9 to Ven. Dis. Inform., U. S. Public Health Service, 1939, p. 87.



vaginal speculum and the necessary stains and reagents for the examination of microscopic smears and of the urine.

The clinical records for male and female patients with gonorrhea recommended by the American Neisserian Medical Society in cooperation with the Public Health Service have this Advisory Committee's endorsement. In addition, this committee has prepared for use in clinics standard record forms for patients with syphilis.

The Subcommittee on Venereal Diseases of the Committee on Chemotherapeutics and Allied Subjects of the National Research Council has recommended for use of the Medical Corps of the Army and Navy and of the Public Health Service a standard nomenclature for syphilis, and it is urged that this nomenclature be adopted by all clinics cooperating with state and local health departments.

The minimum clinic personnel should consist of a qualified physician who will serve as director and clinician in charge, a qualified nurse to assist the physician in the technical aspects of clinic operation and a clerk to keep the clinic records and prepare statistical reports pertaining thereto. In larger clinics additional clinicians, nurses and clerks should be employed to insure effective work as the attendance increases. To this fixed intramural personnel there should be added an adequate field follow-up service, as discussed in the section on case finding and case holding. The medical and nursing personnel in the clinic and the follow-up personnel should possess the qualifications described by the members of the Conference of State and Territorial Health Officers.<sup>2</sup>

Standard schemes of treatment should be adopted by clinics for all patients with early and latent syphilis and syphilis in pregnancy, and gonorrhea in male and female patients. These standards have been described by the Cooperative Clinical Group<sup>4</sup> and by the American Neisserian Medical Society<sup>5</sup> working in cooperation with the Public Health Service and by the Subcommittee on Venereal Diseases of the Committee on Chemotherapeutics and Allied Subjects of the National Research Council. Such schemes should be strictly adhered to unless untoward reactions develop.

In rural areas, facilities for the clinical management of the venereal diseases may be provided by the use of (a) mobile clinics, (b) traveling treatment teams and (c) subsidization of private physicians. The mobile treatment unit has been demonstrated to be effective and economical and to provide adequately for the clinical management of the venereal diseases in rural communities in which facilities for stationary clinics do not exist. It permits at a relatively slight increase in cost the more intensive utilization of the services of the minimal clinic team—clinician, nurse and clerk. Both the mobile clinic and the traveling treatment team render the greatest service in those areas having a well organized health department and should operate under the administrative control of the local health officer. It is desirable that other public health measures necessary for the control of the preventable diseases in general be provided both in the mobile clinic and by the traveling treatment team.

4. Stokes, J. H., and others: Standard Treatment Procedure in Early Syphilis, *Ven. Dis. Inform.* 15: 149-161 (April) 1934. Moore, J. E., and others: The Treatment of Latent Syphilis, *ibid.* 13: 317-331 (Aug. 20), 351-364 (Sept. 20), 371-379 (Oct. 20) 389-401 (Nov. 20), 407-412 (Dec. 20) 1932; 14: 1-12 (Jan.) 1933. Cole, H. N., and others: Syphilis in Pregnancy, *ibid.* 15: 83-107 (March) 1934.

5. Recommendations for a Gonorrhea Control Program: Report of an Advisory Committee to the United States Public Health Service, *Ven. Dis. Inform.* 19: 1-5 (Jan.) 1938.

To determine the efficiency of clinics under the supervision of or cooperating with health departments, it is necessary that a system for appraisal of clinic work be established. This system should account for the stage of infection when each patient seeks treatment, the amount of treatment received, the regularity of administration of treatment and the temporary or permanent lapse of the patient from the treatment schedule. In addition, the system should account for the duration of pregnancy when treatment is begun in pregnant women and for the thoroughness of treatment during pregnancy. The effectiveness of the case finding program in a given clinic should also be measured by accounting for the number of alleged contacts and the number of such contacts brought in for examination and treatment if necessary. The mechanical system of reporting morbidity, progress of treatment and control of the venereal diseases is believed to be the most effective system for the appraisal of clinic work, and it accounts likewise for the reporting of morbidity in the clinics in which it is operated.

Hospitalization should be provided at the request of the director of the venereal disease clinic for (a) open early syphilis in recalcitrant persons, (b) lumbar puncture, postlumbar puncture reactions, (c) fever therapy for neurosyphilis, (d) acute congenital syphilis in infants, (e) acute interstitial keratitis when local treatment is necessary, (f) various forms of late visceral syphilis, (g) acute gonococcal pelvic inflammatory disease, (h) gonococcal vulvovaginitis in children coming from homes where there are other girls and where home conditions are poor, (i) gonococcal ophthalmia in any age group, (j) gonococcal arthritis and (k) the severe acute complications of gonococcal infection such as epididymitis, prostatic abscess and pelvic abscess.

**Distribution of Drugs.**—At least two of the common arsenical preparations (one to be an arsenoxide) and at least one generally accepted bismuth preparation should be distributed without cost to physicians and all other medical agencies authorized by law to administer such drugs in the treatment of syphilis. At this time, the bismuth preparation recommended is bismuth subsalicylate in oil.

Sulfathiazole should be distributed to every public clinic for the treatment of gonorrhea. Purchased in quantity, this drug is relatively inexpensive, is very efficacious and is essentially devoid of untoward reactions within the dosage limits necessary to cure the patient with gonorrhea.

#### CASE FINDING AND CASE HOLDING

There are two effective methods of case finding: One deals with the routine serologic blood testing as a case finding device and the other the tracing through epidemiologic investigations of persons who have been intimately exposed to patients with communicable syphilis and gonorrhea.

Routine serologic blood testing should be encouraged by health officers as a valuable method of case finding in at least the following circumstances:

1. In all patients applying for medical care from hospitals or private physicians, including especially pregnant women.
2. In industry, where recognition of syphilis is a valuable measure in reducing industrial hazards and insurance losses. Periodic blood testing should be encouraged especially in industries in which there is a risk of life or injury to the syphilitic person or to others, or special need for the protection of property. However, blood testing of employees in selected industries such as food handlers, domestic servants, barbers and beauty parlor operators should not be utilized as an index

of infectiousness for other groups, and the testing of such employees is deplorable if they are singled out for undue discrimination.

3. In selected population groups; for example, the entire population of a county, not only as a method of individual case finding but also as a measure of the extent of the syphilis problem in the community.

4. In enrollees of the Army, Navy, Coast Guard, Civil Service and other federal agencies.

5. In candidates for marriage.<sup>6</sup>

In all these categories except the third the blood serologic test should be part of a general physical examination.

Refusal to submit to a serologic test and physical examination in industry should carry no penalty other than refusal of employment if such an examination is required as a prerequisite of original or continued employment. The discovery of syphilis should not per se penalize the person by refusal of employment or dismissal from employment.

The venereal diseases belong in the category of communicable diseases, and every new patient admitted to a treatment service offers a double challenge in case finding and case holding. If the infection is a relatively recent one, the search for its origin and for infections which may already have been transmitted by the patient to others should be begun at once. If the infection is an old one and the chance for finding extrafamilial contacts is remote, nothing less than full investigation of the patient's familial contacts should be considered adequate.

Case holding is essential if the infection is to be kept under control until the patient is cured. It is useless, however, to employ a case holding staff if the fundamental causes of neglect of treatment are ignored. Some of these are:

1. Failure to explain to the patient the nature of the infection and the importance of treatment in controlling communicability.
2. Failure to take into account the patient's economic problems and his ability to pay for private treatment.
3. Transportation difficulties in attending inconveniently located clinics.
4. Rough or discourteous handling of the patient in the clinic.
5. Lack of privacy in the clinic.
6. Dirty, crowded and unattractive clinic quarters.
7. Poor therapeutic technic which causes the patient pain and may result in untoward reactions.

Contact tracing and case holding may be performed by follow-up workers employed by the venereal disease clinic or by the health department. In either case, complete cooperation should be established to render the interviews in clinics most effective and to provide the health department with epidemiologic information necessary to insure the location of the contact or the defaulting patient. The competent follow-up worker should serve with such efficiency that it is necessary to bring formally to the attention of the health department only those patients or contacts who are noncooperative. The follow-up worker of the health department when assigned to epidemiologic work in clinics or for private physicians should serve as the agent of the clinic or the physician and not as the agent of the health department.

It is immaterial whether the follow-up worker is a public health nurse or a medical social worker. Much depends on the training and personal and professional qualifications of the individual. The minimum qualifications for public health nurses engaged in venereal

disease epidemiologic investigations have been defined by the members of the Conference of State and Territorial Health Officers and are available from the Surgeon General of the Public Health Service.

#### INFORMATIVE AND EDUCATIONAL PROGRAM

The informative program among physicians and other scientific workers should begin in the medical school for the physician and during the undergraduate technical collegiate training which the scientific worker receives, should be carried on during postgraduate training periods and should be applied continuously thereafter in an attempt to maintain the support of physicians in private practice and other scientific workers. In undergraduate and postgraduate courses in medicine and public health, the health officer and physicians specializing in the clinical management of syphilis and gonorrhea should encourage and promote the teaching of the most modern methods for the control and the clinical management of the venereal diseases. Those medical schools and teaching institutions which are especially prepared to train personnel in the control of the venereal diseases should be subsidized to make them better qualified for the task and to encourage research in this special field.

The health officer should make a special attempt to recruit interested and unusually competent personnel for service in the venereal disease control division. Eligible young physicians from among hospital interns should be selected and given postgraduate training in sufficient numbers to insure a continuous supply of venereal disease control officers in the state. Practicing physicians who cooperate with the health department in the control of the venereal diseases should also be given postgraduate training at public expense. Two types of training may be provided: (1) the short review course in current diagnostic and therapeutic practice and (2) the prolonged intensive training course to qualify the physician as a specialist.

Informative literature should also be provided for the health officer and the physician. This material should possess the following characteristics: 1. It should be interesting, scientific and brief. 2. Reprints should deal with special problems of diagnosis, treatment or after-care which are frequently met in routine practice. 3. Professional groups should receive copies of material used in the public educational program in order that physicians and other scientific workers may be encouraged to supplement by personal instruction the influence of the pamphlets prepared for popular distribution.

The educational program for the public is of paramount importance in promoting the use of public facilities made available for the control of the venereal diseases. Virtually all mediums of public communication—the press, radio, motion pictures, lectures, publications and graphic material—have been found effective in venereal disease education.

There is incomplete knowledge among health workers of the principles, practices and results of popular education pertaining to the control of the venereal diseases, as well as to public health in general. The Public Health Service has instituted a consultative and advisory plan to make available to local health departments the experience of trained educational workers in the field of venereal disease control who will collaborate with state or local health departments on request. Facilities for the production of all types of educational materials under the most strict professional standards

6. Two members of this advisory committee (Moore and Nelson) feel that for medical, social and political reasons blood testing compulsorily required by law is at present unwise in any category of patients.

of public health, editorial development and graphic treatment are also available to states through the Public Health Service. These consultation services should be utilized fully by state and local health departments to maintain a public interest in the control of the venereal diseases and to insure an accurate and effective educational program.

#### PROPHYLAXIS

Mechanical and local chemical prophylactic measures scientifically tested and applied are important factors in the prevention of the venereal diseases. Physicians, both in clinics and in private practice, should recognize that the proper use of a good prophylactic agent will usually prevent infection, and they should be encouraged to include instruction in the use of such agents when the need arises in their practice.

Particular reference is made to the published report of the Joint Committee on the Chemical and Mechanical Prevention of Syphilis and Gonorrhea, appointed by the American Social Hygiene Association and the Public Health Service.<sup>7</sup> The conclusions expressed in these reports are in general regarded as sound.

#### PROSTITUTION AND THE SPREAD OF THE VENEREAL DISEASES

As with other communicable diseases, it is essential that persons who are actually or potentially infected with the venereal diseases should not be permitted to make promiscuous and unrestricted contacts which will spread the diseases to healthy people. This basic principle of epidemiology applies with the same force in the control of the venereal diseases as in the control of all other communicable diseases. The members of this committee, therefore, deplore the practice of toleration and segregation of prostitutes, either clandestine or professional, and urge that the proper repressive steps be taken by constituted police authorities. All health officers should cooperate with and encourage the police authorities in their jurisdictions to enforce existing laws prohibiting any person from engaging in prostitution or such related activities as procuring, solicitation and assignation.

The members of the Conference of State and Territorial Health Officers adopted comprehensive recommendations for the repression of prostitution throughout the United States. It is urged that all health officers follow these recommendations<sup>8</sup> as a guide in the solution of the prostitution problem in their communities.

#### THE RELATIONSHIP BETWEEN VENEREAL DISEASE CONTROL AND SOCIAL HYGIENE

Social hygiene deals broadly with the study and solution of all human sex relationships and adjustments which are common in any civilization. It attempts to encourage practices which are recognized as good under the moral code and to destroy those which are bad. It has a very valuable place in the general program of public welfare but has a more limited yet very important place in public health.

All factors which lead to sexual promiscuity increase numerically the number of contacts, between infected, potentially infected and healthy persons and consequently are certain to result in an increase in the rates for syphilis and gonorrhea. It is therefore recom-

mended that all state and local health officers cooperate with and encourage the American Social Hygiene Association and affiliated local social hygiene societies.

#### PRESCRIBING DRUG CLERK AND THE CHARLATAN

Health officers and competent physicians should discourage the practice of counter-prescribing by drug clerks and the administration of treatment by practitioners who are not competent and qualified in the clinical management of the venereal diseases. Legislation to prohibit the administration of treatment by such persons should be enacted and governmental agencies established which will provide an inspection service to prevent such activities. In many states, a satisfactory inspection service may be organized under the food and drug administration of the state in cooperation with the state board of medical licensure, the state pharmaceutical board, the state medical and pharmaceutical associations and the state department of health.

#### VENEREAL DISEASE CONTROL IN THE NATIONAL DEFENSE PROGRAM

The venereal diseases still constitute the most serious public health problem in the development of the national defense program. Persons in the civilian population constitute alternate links in the chain of venereal disease infections in the armed forces. It is urged, therefore, that all health officers apply the principles set forth in the "Agreement by the War and Navy Departments, the Federal Security Agency and State Health Departments on Measures for the Control of the Venereal Diseases in Areas Where Armed Forces or National Defense Employees are Concentrated."<sup>9</sup> This agreement was approved by the members of the Conference of State and Territorial Health Officers in May 1940.

#### FINANCING THE VENEREAL DISEASE CONTROL PROGRAM

The proportion of state and local health department funds to be allotted for the control of the venereal diseases should be sufficient to secure adequate protection of the public against the spread of these diseases by infected persons and to provide proper treatment, skilled medical care and maximum privacy for the individual patient. The responsibility of providing public funds lies with the state, the local and the federal governments. Both state and local appropriations, therefore, should be made available to supplement the federal funds which are allotted for this purpose. The Public Health Service should maintain its matching requirements at such a level that both state and local aid will be necessary throughout the country.

The Venereal Disease Control Act of May 24, 1938 requires that allotments be made to the several states on the basis of (a) the population, (b) the extent of the venereal disease problem and (c) the financial need. The same factors should be applied by the state health officer in the reallocation of funds for the control of the venereal diseases within the state.

Careful consideration should be given to the amount of money necessary to develop an optimum program for the control of venereal disease in a given community. It is important that the public be informed of this need if it is to support the appropriation of funds by legislative bodies for effective and economical use by the health department.

7. Hazen, H. H., and others: The Chemical and Mechanical Prevention of Syphilis and Gonorrhea, *Ven. Dis. Inform.* 21: 311-313 (Oct.) 1940; *J. A. M. A.* 115: 1185-1186 (Oct. 5) 1940.

8. Proc. Conference State and Territorial Health Officers, 1940, U. S. Public Health Service.

9. An agreement by the War and Navy Departments, the Federal Security Agency and State Health Departments on Measures for the Control of the Venereal Diseases in Areas Where Armed Forces or National Defense Employees Are Concentrated, *Ven. Dis. Inform.* 21: 277 (Sept.) 1940.

# ADRENAL MEDULLA—CORI AND WELCH

## GLANDULAR PHYSIOLOGY AND THERAPY

THE ADRENAL MEDULLA

CARL F. CORI, M.D.

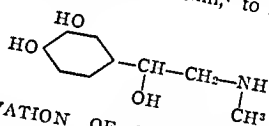
AND  
ARNOLD DEM. WELCH, M.D.  
ST. LOUIS

*This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the authors and do not necessarily represent the views of the Council.—Ed.*

Epinephrine has been studied extensively as a physiologic and as a pharmacologic agent. The subject has wide ramifications, and only what appear to be the most significant findings can be discussed in the space available.

### ISOLATION OF EPINEPHRINE

The staining reactions described by Vulpian (green color with ferric chloride) and by Henle (brownish yellow color with dichromates) offered the first evidence for the presence in the medulla of the adrenal gland of a substance absent from most other tissues. Following the observation by Oliver and Schäfer<sup>1</sup> of the remarkable pressor effect of extracts of the adrenal medulla, intensive efforts were made to isolate the blood pressure-raising principle. Takamine<sup>2</sup> and Aldrich<sup>3</sup> isolated the free base, while Abel<sup>4</sup> reported the isolation of a crystalline substance, which was later shown to be a benzoyl derivative formed during isolation. The name "epinephrine," proposed by Abel for this derivative, was subsequently adopted as "official" for the natural substance. The term "adrenalin" is still trademarked in this country. The correct empiric formula was determined by Aldrich<sup>5</sup> and eventually shown, through the efforts of many workers and synthesis by Stolz<sup>6</sup> and by Dakin,<sup>7</sup> to represent the following structure.



### INNERVATION OF MEDULLARY CELLS

It has been known since the work of Elliott,<sup>8</sup> and his work has since been repeatedly confirmed, that the innervation of the adrenal medulla is of the preganglionic type, a finding consistent with the view that the medullary cells are modified ganglion cells. Recent work by Young<sup>9</sup> confirms the essential absence of postganglionic fibers in the adrenal medulla (cat) and emphasizes the large number of roots which send fibers to the medulla; these fibers arise from at least the sixth to the sixteenth segment of the spinal cord and pass without synaptic interruption to the cells they innervate. The greater adrenal nerve conducts the majority of these fibers to the adrenal gland, where a network is formed in the connective tissue; after penetrating the cortex, without innervating it, the fibers end in intimate relationship with the medullary cells. Young found that each nerve fiber innervates a definite number of cells; in this manner units are formed which may conceivably be recruited much like the units of voluntary muscle.

*Nerve Control of the Secretion of Epinephrine.*—The preganglionic fibers supplying the adrenal medulla, like those to the sympathetic ganglia, arc of the cholinergic type; i. e., on

stimulation they produce a substance pharmacologically indistinguishable from acetylcholine (Feldberg and co-workers<sup>10</sup>). A liberation of epinephrine from the adrenal medulla can be shown to follow a suitable injection of acetylcholine. The effects of splanchnic stimulation and of the injection of acetylcholine are greatly increased by a previous injection of physostigmine, a drug known to inhibit the enzyme (esterase) responsible for the inactivation of acetylcholine. After the injection of physostigmine, acetylcholine when perfused through the isolated adrenal gland increases considerably the output of epinephrine (Heard and Welch<sup>11</sup>).

The adrenal medulla, like the sympathetic ganglia, is not paralyzed by atropine in small doses. Nicotine, however, the typical effect of which is to paralyze all autonomic ganglia after transient stimulation of them, causes the adrenal medulla to fail to respond to splanchnic stimulation, after a short period of augmented secretion of epinephrine.

An increased discharge of epinephrine from the adrenal medulla has been demonstrated under a variety of conditions, among which may be mentioned stimulation of sensory nerves, states of fear and rage, muscular activity, asphyxiation, hemorrhage, hypoglycemia, application of excessive heat or cold and administration of convulsant drugs (strychnine, picrotoxin, inhalation anesthetics (chloroform and ether), morphine (in cats and dogs) and histamine (for literature, see Trendelenburg<sup>12</sup>). In many of these cases the epinephrine content of the adrenal medulla (which represents a balance between the rate of new formation and the rate of discharge) is found to be diminished.

Sectioning of the splanchnic nerves, the principal efferent arm of the reflex arc, abolishes or greatly diminishes the discharge of epinephrine. The central connections, however, are not definitely known. Stimulation of certain hypothalamic areas is followed by an increase in secretion of the hormone,<sup>13</sup> as well as by other manifestations of sympathetic hyperactivity. The prolonged hyperglycemia and hyperlactacidemia which follow the piqure of Claude Bernard are due in large part to liberation of epinephrine from the adrenal medulla.

Whether there is a basal rate of secretion of epinephrine has perhaps not been unequivocally established, but it is probably safe to conclude that so long as nerve impulses reach the medullary cells epinephrine is liberated. The physiologic significance of such secretion of epinephrine appears to be small, since denervation of the adrenals or even complete sympathetomy does not lead to notable functional disturbances under normal environmental conditions. The increased discharge of epinephrine under conditions of stress is regarded by Cannon and his school<sup>14</sup> as an emergency function; it serves to reinforce the activity of the sympathetic nervous system and causes a variety of circulatory and metabolic adjustments which (by *a priori* reasoning) are assumed to be useful to the organism. The evidence presented may be summarized by saying that the adrenal medulla consists of modified sympathetic ganglion cells under the control of cholinergic preganglionic fibers arising in the thoracolumbar portion of the spinal cord, and that secretion of epinephrine is normally dependent on the degree of activity of these fibers.

### SYMPATHOMIMETIC ACTION OF EPINEPHRINE

The action of epinephrine on a given tissue may be inhibitory or excitatory; it is identical, however, with the effect produced by stimulation of the sympathetic fibers supplying the tissue, provided the fibers are of the adrenergic type, i. e., on stimulation, produce an epinephrine-like substance.<sup>15</sup> A change in the effect of sympathetic stimulation—for example, from an inhibitory effect on the uterus of the nonpregnant cat to an excitatory effect in the pregnant animal—is paralleled by a similar change in the response to epinephrine. Some of

JOUR. A. M. A.  
JUNE 7, 1941

From the Department of Pharmacology, Washington University School of Medicine.  
1. Oliver, G., and Schäfer, E. A.: *J. Physiol.* **18**: 230, 1895.  
2. Takamine, J.: *J. Physiol.* **27**: xxix, 1901.  
3. Aldrich, T. B.: *Am. J. Physiol.* **5**: 457, 1901.  
4. Abel, J.: *Pull. Johns Hopkins Hosp.* **13**: 29, 1902.  
5. Aldrich, T. B.: *J. Am. Chem. Soc.* **27**: 1074, 1905.  
6. Stolz, F.: *Ber. d. deutsch. chem. Gesellsch.* **37**: 4149, 1904.  
7. Dakin, H. D.: *Proc. Roy. Soc. London, s. B* **76**: 491, 498, 1905.  
8. Elliott, T. R.: *J. Physiol.* **46**: 285, 1913.  
9. Young, J. Z.: *J. Anat.* **73**: 540, 1939.

10. Feldberg, W.; Minz, B., and Tsudzimura, H.: *J. Physiol.* **81**: 286, 1934.  
11. Heard, R. D. H., and Welch, A. D.: *Biochem. J.* **29**: 998, 1935.  
12. Trendelenburg, P.: *Die Hormone*, Berlin, Julius Springer, 1929, vol. 1, p. 313.  
13. Houssay, B. A., and Molinelli, E. A.: *Compt. rend. Soc. de Biol.* **93**: 1454, 1925.  
14. Cannon, W. B.: *Ergebn. d. Physiol.* **27**: 380, 1928.  
15. Some sympathetic fibers, e. g., those innervating the sweat glands of some species, are cholinergic, and the effect of their stimulation is therefore "mimicked" by the injection of acetylcholine chloride and not by that of epinephrine hydrochloride.

## ADRENAL MEDULLA—CORI AND WELCH

the more important "sympathomimetic" actions of epinephrine are represented in constriction of arterioles, acceleration of the heart rate, contraction of the radial muscle of the iris and of the nictitating membrane, salivary secretion, relaxation of bronchial musculature, inhibition of the small intestine and inhibition of the uterus and bladder (in certain species).

When the sympathetic fibers supplying smooth muscle or other tissues are cut and sufficient time is allowed for degeneration of the peripheral segments, the action of epinephrine is not abolished;<sup>16</sup> this indicates that epinephrine does not act on the nerve endings of these fibers. It is incorrect to conclude, however, that epinephrine acts directly on smooth muscle fibers; a number of drugs act in this manner (for instance, barium ions), but their effect does not parallel that of sympathetic stimulation. Elliott<sup>17</sup> suggested that the union of the sympathetic nerve fiber with the muscle fiber causes the development of a special structure, the "myoneural junction," which is neither nervous nor contractile but which renders the associated cell peculiarly sensitive to epinephrine. When this structure has once developed as the result of innervation,<sup>18</sup> it remains intact despite denervation and the cell retains its sensitiveness to epinephrine. Clark<sup>19</sup> has shown that the amount of epinephrine taken up by isolated tissues when a measurable effect is produced is so small that only a small fraction (less than 1 per cent) of the cell surface could be occupied. This leads to the concept that epinephrine acts on certain specific receptors in the cell, which (in the case of smooth muscle) are in intimate relation with the contractile mechanism.

**Transmission of Nerve Impulses.**—It is generally assumed that there exists discontinuity between the termination of the nerve fibers and the muscle cell, and the question arises how stimulation of sympathetic nerve fibers can produce the same effect as epinephrine. Two theories have been proposed for the transmission of nerve impulses, one electrical and the other chemical; only the latter, which had its inception in the work of Loewi,<sup>20</sup> is within the scope of this review.<sup>21</sup>

According to the humoral transmission theory, an epinephrine-like substance is liberated at the termination of the sympathetic "adrenergic" fibers. This chemical mediator (which seems to be identical with epinephrine) reaches the receptor mechanism of the cell by diffusion; there it combines with a specific substance E if the effect is excitatory and with a specific substance I if the effect is inhibitory. Cannon and his school<sup>22</sup> have shown that the products of these combinations, "sympathin E" and "sympathin I," may escape from the site of their formation and be carried by the blood stream to distant tissues, where they produce effects which differ from each other and from effect of epinephrine. For example, sympathin E released by stimulation of the hepatic nerve fibers has a pressor action and causes contraction of the nictitating membrane but, unlike epinephrine, produces no significant pupillary dilatation or relaxation of the uterus of the nonpregnant cat. Certain drugs (ergot alkaloids, yohimbine and synthetic dioxane derivatives), which abolish the pressor effect of epinephrine have little effect on the rise in blood pressure produced by sympathin E (released as the result of stimulation of hepatic or lumbar nerve fibers). It has been shown recently that stimulation of sympathetic nerve fibers supplying the rabbit ear results in liberation not only of an epinephrine-like substance but also of a compound closely resembling histamine,<sup>23</sup> both detectable in the venous

blood of the ear. This suggests that the "sympathin E" and "sympathin I" effects may conceivably be resultants of release of more than one pharmacologically active substance. When adrenergic nerve trunks are stimulated in vitro an epinephrine-like substance diffuses into the surrounding medium (Lissák<sup>24</sup>). Several authors who found an epinephrine-like substance in extracts of various tissues probably obtained this material from the adrenergic fibers contained in the tissue, since, as Cannon and Lissák have shown, degeneration of the sympathetic fibers supplying a tissue (heart or liver) results in the disappearance of the sympathomimetic

## Formation of Epinephrine

1. Epinephrine (Adrenalin)
2. Phenylalanine
3. Tyrosine
4. Dihydroxyphenylalanine (Dopa)
5. N-methyl tyrosine
6. Adrenalone
7. Tyramine
8. Phenylethylamine
9. Dihydroxyphenyl-ethylamine (Dopamine)
10. Quinone of epinephrine
11. Catechol
12. Ephedrine
13. Benzedrine (Amphetamine)
14. Veritol
15. Norepinephrine (Arterenol)

substance. Lissák<sup>26</sup> reported that when the preganglionic (cholinergic) fibers of the superior cervical ganglions (cat) are cut, there occurs, after a week or two, a disappearance of the acetylcholine which is normally present, while a substance with the properties of epinephrine remains in the ganglion. These observations show that adrenergic neurons are characterized by the presence of epinephrine (or a substance closely resembling this principle in its pharmacologic and chemical properties) in cell bodies, axons and their terminations and by the liberation of epinephrine during nerve activity. The situation is similar to that obtaining in cholinergic neurons, in which acetylcholine is the characteristic substance that acts on the receptor mechanism of the (muscle or gland) cell. However, a collection of specially differentiated cells containing acetylcholine and displaying an auxiliary function comparable to that which the adrenal medulla bears to the adrenergic system has not been demonstrated.

24. Lissák, K.: *Am. J. Physiol.* **126**: 564, 1939; **127**: 263, 1939.  
25. Footnote deleted.  
26. Lissák, K.: *Am. J. Physiol.* **125**: 778, 1939.

16. As a matter of fact, it is greatly increased. When one eye is sympathetically denervated and the other kept as a control, doses of intravenously injected epinephrine hydrochloride which dilate the pupil of the denervated eye have no effect on the normal eye. Denervated structures (eye, heart, blood vessels) have been used as sensitive indicators of an increased discharge of epinephrine from the adrenals.  
17. Elliott, T. R.: *J. Physiol.* **32**: 401, 1905.  
18. It is of interest that placental vessels, which have no nerve supply, respond to epinephrine and acetylcholine very weakly. This supports Elliott's idea of the development of a special receptor substance under the influence of innervation.  
19. Clark, A. J.: *The Mode of Action of Drugs on Cells*, Baltimore, William Wood & Company, 1933.  
20. Loewi, O.: *The Humoral Transmission of Nerve Impulse*, in Harvey Lectures, 1932-1933, Baltimore, Williams & Wilkins Company, 1934.  
21. It may be pointed out that these two theories are not mutually exclusive if it is conceded that the receptor mechanism of the smooth muscle cell may be stimulated (or inhibited) electrically as well as by a specific chemical substance.  
22. Cannon, W. B., cited by Rosenbluth, A.: *Physiol. Rev.* **17**: 514, 1937.  
23. Lambert, E. H., and Rosenthal, S. R.: *Proc. Soc. Exper. Biol. & Med.* **44**: 235, 1940.



An integral part of the humoral transmission theory (if it is to account for the observed bioelectric phenomena) is not only the formation of the chemical mediator but also the inactivation of this principle at the site of action. Observations concerning the formation, stabilization and destruction of epinephrine will be reviewed briefly.

#### FORMATION OF EPINEPHRINE

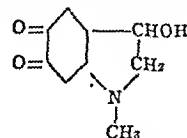
The most likely precursor of epinephrine (see table, no. 1) is phenylalanine (table, no. 2), one of the amino acids known to be indispensable at least for growth (rats). The introduction of two hydroxyls (in positions 3 and 4) into the benzene ring is an essential step in the synthesis of epinephrine from phenylalanine. The body readily introduces the first hydroxyl, converting phenylalanine to tyrosine (table, no. 3), but the mechanism of insertion of the second hydroxyl has remained obscure. An enzyme, tyrosinase, which has the specific property of introducing this second hydroxyl into tyrosine, converting it to dihydroxyphenylalanine (dopa) (table, no. 4), occurs in plants but has not been found in mammalian tissues. Recently, however, Arnow<sup>27</sup> has shown that ultraviolet radiation in vitro converts tyrosine into dihydroxyphenylalanine, a reaction which is catalyzed by  $\text{Fe}^{++}$  ions (Rothman<sup>28</sup>); a similar reaction in the skin might furnish the necessary precursors for the formation of epinephrine, as well as for the formation of melanin, the pigment of human skin.<sup>29</sup> Heard and Raper,<sup>30</sup> in a study of the oxidation of N-methyl tyrosine (table, no. 5) by tyrosinase, found, in addition to melanin, a small amount of pressor substance, the activity of which was increased by hydrogenation, suggesting that adrenalone (table, no. 6) had been formed. One possible pathway of the synthesis of epinephrine might therefore be the formation of dihydroxyphenylalanine, the oxidation of the  $\beta$ -carbon of the side chain with formation of a hydroxyl group, methylation of the amino group and finally decarboxylation. Enzymes responsible for these reactions have not been isolated from mammalian tissues. Incubation of adrenal medullary tissue with a number of possible precursors of epinephrine (tyramine [table, no. 7],<sup>31</sup> phenylethylamine [table, no. 8],<sup>32</sup> dihydroxyphenylethylamine (dopamine) [table, no. 9]<sup>33</sup>) has not, so far, yielded results of great value in the elucidation of the synthesis of epinephrine.

#### STABILIZATION AND DESTRUCTION OF EPINEPHRINE

It has long been known that epinephrine is much more stable in blood than in Ringer's solution and that many other tissues contain substances which exert a protective action on the hormone. Several authors have studied the stabilizing effect of amino acids on epinephrine. This is not accomplished through the formation of complexes, as was suggested by Wiltshire,<sup>34</sup> but through the amino acids serving as hydrogen donors to the quinone of epinephrine (table, no. 10), a portion of which is thereby reduced to epinephrine (Welch<sup>35</sup>). In this manner the rate of destruction of epinephrine is decreased. Much more effective than amino acids are glutathione and ascorbic acid, two reducing substances which are present in most tissues; they prevent the irreversible oxidation of epinephrine by molecular oxygen<sup>35</sup> and by the widely distributed cytochrome—cytochrome oxidase system.<sup>36</sup> The high concentration of ascorbic acid and of glutathione in the adrenal gland may be related to the stabilization of the hormone either in the gland or in the blood leaving it. Heard and Welch<sup>11</sup> showed that perfusates of the adrenal gland always contain ascorbic acid; in such perfusates the pressor activity remains unchanged as long as reduced ascorbic acid is present. With completion of the

oxidation of ascorbic acid, the red color of oxidized epinephrine appears, followed by a progressive decrease in pressor activity.<sup>37</sup>

It is very unlikely that nonenzymatic auto-oxidation of epinephrine represents a mechanism by which epinephrine is inactivated in the tissues. In vitro it has been shown that heavy metal ions and an alkaline reaction favor this auto-oxidation. Ball and Chen<sup>38</sup> showed that there is first formed an extremely unstable quinone (table, no. 10); apparently this undergoes internal oxidation-reduction and rearrangement to form an unstable indole derivative, called adrenochrome:<sup>38</sup>



Various oxidizing agents form adrenochrome or derivatives of it (e. g., iodoadrenochrome) from epinephrine. The red color which develops in solutions of epinephrine is probably due, at least in part, to the formation of adrenochrome, a substance which is pharmacologically inactive. Green and Richter<sup>39</sup> have demonstrated the oxidative formation of adrenochrome from epinephrine through catalysis by hematin derivatives and by the cytochrome—cytochrome oxidase system. Of particular significance is the observation that the sympathomimetic 3, 4 dihydroxybenzene derivatives most rapidly destroyed in vivo are also those most rapidly oxidized by this system, which may well be concerned with the physiologic inactivation of epinephrine.<sup>39</sup>

In addition to this enzyme system which attacks the catechol (table, no. 11) portion of the molecule, there is present in mammalian tissues another enzyme, amine oxidase,<sup>40</sup> which attacks a multitude of amines, converting them to aldehydes and ammonia (in the case of epinephrine, methylamine is formed instead of ammonia). The oxidation of epinephrine by this enzyme is apparently not inhibited by reducing substances.

Ephedrine (table, no. 12), benzedrine (table, no. 13), veritol (table, no. 14) (and other substances related to epinephrine, with a methyl group attached to the carbon adjacent to the nitrogen) are not attacked by this enzyme but are able to compete with epinephrine and the sympathetic mediator for amine oxidase, thus protecting them from destruction. Gaddum and Kwiatkowski<sup>41</sup> demonstrated that epinephrine and the sympathetic mediator are strikingly potentiated by ephedrine in their action on the blood vessels of the rabbit ear and explain this effect as due to the inhibition of amine oxidase. In agreement with this interpretation are the observations that denervation of blood vessels and of the iris, procedures which abolish the formation of the sympathetic mediator, greatly diminish the action of ephedrine and that the action of ephedrine is restored when epinephrine is present in the circulation.<sup>42</sup> Morton and Tainter,<sup>43</sup> in a detailed study of the action of ephedrine on blood vessels, found most of the results compatible with the view that this substance inhibits amine oxidase.

Richter<sup>44</sup> reported recently that orally administered d-epinephrine and l-epinephrine are mainly eliminated as conjugated derivatives in the urine, from which he concludes that conjugation with sulfate is the main physiologic process by which epinephrine is inactivated in the body.

Several other enzymes are capable of oxidizing epinephrine (e. g., catechol oxidase, peroxidase, tyrosinase), but these have rarely if ever been found in mammalian tissues. Bacq<sup>45</sup> claimed

37. Addition of ascorbic acid to isolated tissues does not intensify or prolong the action of epinephrine, presumably because considerable amounts of reducing substances are present in the tissues to begin with. It seems necessary to assume that there exists in the tissues a mechanism for the destruction of epinephrine which is not inhibited by reducing substances.

38. Ball, E. G., and Chen, T.: *J. Biol. Chem.* **102**: 691, 1933.

39. It is of interest that epinephrine can replace flavoprotein as a carrier in certain enzyme systems which reduce diphosphopyridine nucleotide (e. g., lactic dehydrogenase); this property is dependent on the oxidation of epinephrine to adrenochrome.

40. Blaschko, H., Richter, D., and Schlammann, H.: *Biochem. J.* **31**: 2187, 1937.

41. Gaddum, J. H., and Kwiatkowski, H.: *J. Physiol.* **94**: 87, 1938.

42. The nictitating membrane seems to be an exception, since the action of ephedrine is not abolished by denervation and since ephedrine has only a minor effect in prolonging or enhancing the action of epinephrine on this structure.

43. Morton, M. C., and Tainter, M. L.: *J. Physiol.* **98**: 263, 1940.

44. Richter, D.: *J. Physiol.* **98**: 361, 1940.

45. Bacq, Z. M.: *J. Physiol.* **92**: 28P, 1938.

27. Arnow, L. E.: *J. Biol. Chem.* **120**: 151, 1937; *Science* **87**: 308, 1938.

28. Rothman, S.: *Proc. Soc. Exper. Biol. & Med.* **44**: 485, 1940.

29. The possible relation between the abnormal pigmentation and the destruction of the adrenal medulla in Addison's disease has often been pointed out.

30. Heard, R. D. H., and Raper, P. S.: *Biochem. J.* **27**: 36, 1933.

31. Schuler, W., and Wiedemann, A.: *Ztschr. f. physiol. Chem.* **233**: 235, 1935.

32. Devine, J.: *Biochem. J.* **34**: 21, 1940.

33. Vinet, A.: *Compt. rend. Acad. d. Sc.* **210**: 552, 1940.

34. Wiltshire, M. O. P.: *J. Physiol.* **72**: 83, 1931.

35. Welch, A. D.: *Am. J. Physiol.* **105**: 360, 1934.

36. Green, D. E., and Richter, D.: *Biochem. J.* **31**: 596, 1937.



that a catechol oxidase is present in the smooth muscle of the uterus, but this has not been confirmed by Lissák<sup>46</sup> and others. The evidence available at present points to the cytochrome—cytochrome oxidase system—and to amine oxidase as the enzymes principally concerned with the physiologic inactivation of epinephrine.

#### RELATION BETWEEN CHEMICAL STRUCTURE AND ACTION

In a large number of investigations, among which those of Barger and Dale<sup>47</sup> may be mentioned particularly, it has been made clear that nearly all compounds with relatively simple substitution of the phenylethylamine skeleton (table, no. 8) possess some sympathomimetic action. The role of the various groupings may be summarized as follows: The catechol portion (table, no. 11) of the molecule enables it to undergo oxidation to a quinone, with indole rearrangement, adrenochrome formation and loss of physiologic activity. The greater stability of many of the synthetic sympathomimetic compounds in clinical use may be attributed to the absence of one or both of the hydroxyls found on the benzene ring of epinephrine.

The hydroxyl group on the carbon atom adjacent to the benzene ring confers optical activity on the molecule; this is of significance since the naturally occurring or l-epinephrine is approximately fifteen times as active as the d-isomer. It may be pointed out here that none of the numerous synthetic compounds related to epinephrine has a pressor activity greater than that of the naturally occurring principle, although some possess definite advantages for one or another therapeutic use. Another possible role for the hydroxyl group in the side chain might be related to ester formation. There is some evidence for the presence of a precursor of epinephrine in the adrenal medulla, and an ester involving this group might be expected to yield epinephrine readily.

The significance of the methyl group in epinephrine is obscure; the pressor activity of the demethylated compound (norepinephrine or arterenol [table, no. 15]) differs but little from that of epinephrine. Barger and Dale<sup>47</sup> pointed out that N-methyl epinephrine-like compounds excel as "inhibitors," while the corresponding unmethylated amines are often superior in producing "augmentation." This has led to the suggestion that sympathin E might be norepinephrine, but the results obtained by Gaddum and Kwiatkowski<sup>41</sup> do not support this view.

#### HEMODYNAMIC EFFECTS OF EPINEPHRINE

The blood pressure response to intravenously injected epinephrine hydrochloride is characterized by a very short latent period, a dependence of the magnitude of the response on the dose (within certain limits) and a rapid return to normal. When epinephrine is liberated from the adrenals or when epinephrine hydrochloride is injected intravenously, it must pass through the right chambers of the heart, the pulmonary circulation and the left chambers of the heart before reaching the systemic vascular bed. It is of importance, therefore, that the blood vessels of the lung are relatively insensitive to the constrictor action of epinephrine and that the coronary vessels of the heart are actually dilated by the drug. The additional work of the heart during a rise in blood pressure could not be sustained without the increased oxygen supply that the dilated coronaries afford. Similarly, the greatly increased flow of blood through a working skeletal muscle is not interfered with by pressor doses of epinephrine hydrochloride and the flow through resting muscle may actually be increased by small doses.

The most intensive effect of epinephrine is on the arterioles, which are richly endowed with smooth muscle supplied with sympathetic (adrenergic) nerves. The constriction of these vessels, particularly in the splanchnic area, causes increased resistance to the circulation of the blood, as a result of which the blood pressure

begins to rise. In the excised heart epinephrine causes an increase in rate and contractility; in the intact animal this effect of epinephrine is less marked, because the rising blood pressure, through stimulation of the pressor receptors of the carotid sinus and the aorta and the resultant vagal reflex, depresses the cardiac rate. When the pressor reflex mechanism is abolished by section of the vagi or by atropinization, a given dose of epinephrine hydrochloride causes a much greater rise in blood pressure and acceleration of the heart rate than when the reflex mechanism is intact.

During the abrupt initial rise in blood pressure the output of the heart probably decreases; this is followed, however, by an increase in cardiac input and output when the blood expressed from the contracted splanchnic area and the spleen has reached the left cavities of the heart, and by a marked increase in the rate of blood flow. As a result of the changes outlined, the circulatory system may be said to operate at a "higher level" with increases in blood flow, circulating blood volume and blood pressure.

The effect of a single intravenous injection of epinephrine hydrochloride is of short duration. Continuous injection of the drug may be used to maintain blood pressure at an elevated level for long periods, the level depending on the amount injected per unit of time. The minimal rate of constant intravenous injection (in milligrams per kilogram per minute) which causes a rise in blood pressure is 0.00005 in man, 0.0005 in dogs, cats and rabbits and 0.001 in rats (Cori<sup>48</sup>).<sup>49</sup> These figures show that the vascular system of man is more sensitive to the action of epinephrine than that of other species. In the laboratory animals mentioned, subcutaneously injected epinephrine hydrochloride does not cause a rise in blood pressure; in man, however, such injection of the drug (0.5 to 1 mg.) is generally followed by a rise in systolic blood pressure<sup>50</sup> (10 to 30 mg. of mercury), in pulse rate (10 to 20 beats per minute), in minute volume of the heart (20 to 70 per cent) and in the volume of respiration (50 to 100 per cent), effects which reach their maximum after one-half hour and disappear after one to two hours; extrasystoles are often noted.

#### METABOLIC EFFECTS OF EPINEPHRINE

The chief metabolic changes which result from the administration of epinephrine are increases in blood sugar, blood lactic acid and basal metabolic rate. Procedures which cause an increased discharge of epinephrine from the adrenals (see a preceding section) lead to the same metabolic changes. The maximal rate at which epinephrine is discharged from the adrenals during splanchnic stimulation in cats has been shown to be 0.003 mg. per kilogram per minute;<sup>51</sup> this procedure causes a decided rise in blood pressure. It should be emphasized that metabolic changes may be produced in unanesthetized dogs, rabbits and cats by intravenous injection at the rate of 0.0002 mg. per kilogram per minute, i. e., at a rate which does not cause a rise in blood pressure. Furthermore, subcutaneous injection of epinephrine hydrochloride in these species causes hyperglycemia and glycosuria without changes in blood pressure. In man, epinephrine hydrochloride injected

48. Cori, C. F.: *Physiol. Rev.* **11**: 143, 1931.

49. It should be emphasized that epinephrine hydrochloride when injected in doses too small to raise blood pressure may nevertheless cause well defined vascular changes; i. e., the vessels of the skin may contract while those of muscles are dilated.

50. The diastolic blood pressure often decreases in man following the subcutaneous injection of epinephrine hydrochloride, because of vasodilatation in certain vascular areas, particularly in muscle.

51. Cannon, W. B., and Kappert, D.: *Am. J. Physiol.* **58**: 308, 1922.

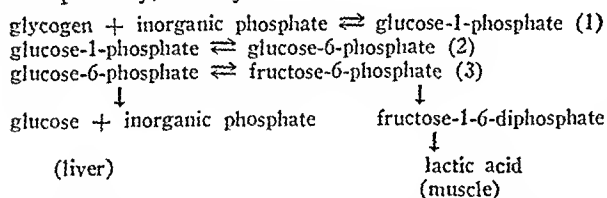
46. Lissák, K.: *Science* **57**: 371, 1938.

47. Barger, G., and Dale, H. H.: *J. Physiol.* **41**: 19, 1910.

intravenously at the rate of 0.00005 mg. per kilogram per minute causes a rise in blood sugar as well as in lactic acid and in basal metabolic rate.<sup>52</sup> In all species this rise is detectable a few minutes after the start of the injection, continues while the injection is being made and slowly subsides following the cessation of the injection. The lowest rate of intravenous injection which causes a rise in blood sugar also causes a rise in blood lactic acid. Within a certain range there is a parallelism between rate of injection and magnitude of response.

A single intravenous injection, even of a large dose, produces metabolic changes of only moderate intensity, while the same dose when injected slowly during two hours causes marked hyperglycemia and hyperlactacidemia. For example, a rabbit responded to a single intravenous injection of 0.03 mg. per kilogram with a maximal rise in blood sugar of 60 mg. and in blood lactic acid of 10 mg. per hundred cubic centimeters; the same dose when injected at a rate of 0.00025 mg. per kilogram per minute for one hundred and twenty minutes (0.03 mg. per kilogram) caused a rise in blood sugar of 180 mg. and in lactic acid of 32 mg. per hundred cubic centimeters. In the latter case the conditions are comparable to subcutaneous injection, a procedure which, owing to continuous absorption of the drug from the subcutaneous depot, causes intense and prolonged hyperglycemia in rabbits.<sup>53</sup> These observations emphasize the fact that epinephrine is rapidly inactivated in the body and that a prolonged effect is dependent on a continuous supply of the drug. Since epinephrine is quite stable in the blood itself, this inactivation must occur in other tissues, presumably at the site of action of the drug. The liver has been shown to be an important organ for the inactivation of epinephrine, but rapid inactivation occurs even in hepatectomized animals.

Epinephrine accelerates the rate of enzymatic breakdown of glycogen in liver and muscle, the end products of this breakdown being dextrose in the former and lactic acid in the latter case.<sup>54</sup> The formation of blood sugar and lactic acid from glycogen follows a common initial pathway, namely:



The first of the aforementioned reactions represents a reversible enzymatic equilibrium; it has been shown that the direction in which the reaction proceeds (i. e., whether it goes to the right or to the left) is determined by the relative concentrations of inorganic phosphate and glucose-1-phosphate. The second reaction, the enzymatic conversion of glucose-1-phosphate to glucose-6-phosphate, accelerates the breakdown of glycogen by disturbing the equilibrium of the first reaction. In liver glucose-6-phosphate is acted on by a phosphatase which splits the ester to glucose and inorganic phosphate; in muscle, which does not contain an active phosphatase, the ester is converted to lactic acid.<sup>55</sup>

The formation of lactic acid is secondary to the accumulation of hexosemonophosphate. When isolated frog muscles are immersed in Ringer's solution containing epinephrine hydrochloride in a concentration of 1:10,000,000, there occur a decrease in glycogen, an increase in hexosemonophosphate and a corresponding decrease in inorganic phosphate; only a small amount of lactic acid is formed.<sup>56</sup> The same changes are observed in mammals when epinephrine is injected subcutaneously, except that a greater part of the muscle glycogen which is broken down is converted to lactic acid. The decrease in the inorganic phosphate of the blood which is observed in mammals following the injection of epinephrine hydrochloride is due to the accumulation of hexosemonophosphate in muscle. The drop in serum potassium which takes place, after a short initial rise, may also be connected with the accumulation of hexosemonophosphate.

In postabsorptive rats subcutaneously injected epinephrine hydrochloride caused a decrease in muscle glycogen and an increase in hepatic glycogen three hours after injection. When the course of this reaction was studied, it was found that fifteen minutes after the injection of epinephrine hydrochloride the hepatic glycogen had decreased, that it reached the original level after one hour and that it exceeded the original level three hours after the injection; muscle glycogen, which decreased initially, remained low throughout the period of observation. The explanation of these findings is that the lactic acid which is formed from glycogen in muscle escapes into the blood stream and is carried to the liver, where it is converted back to glycogen. Initially the rate of glycogen breakdown in the liver exceeds that of glycogen formation, but later this is reversed, so that the end effect of an injection of epinephrine hydrochloride is a redistribution of glycogen, an increase in hepatic glycogen at the expense of muscle glycogen.<sup>48</sup> The same changes in the distribution of glycogen, with somewhat different time relations, have been observed in rabbits.

The immediate effect of epinephrine on the blood sugar level depends on the content of glycogen in the liver. The hyperglycemic response is much smaller in animals with low hepatic glycogen than in those with large glycogen stores. The maintenance of an elevation of the blood sugar level for longer periods depends on the supply to the liver of material from which new carbohydrate (liver glycogen and blood sugar) can be formed. Injections of epinephrine do not cause increased excretion of nitrogen in the urine, which indicates that protein is not the source of the newly formed carbohydrate. Balance experiments in normal animals have shown that the decrease in muscle glycogen is of sufficient magnitude to account for the newly formed carbohydrate in the liver. In depancreatized dogs injections of epinephrine hydrochloride cause excretion of a large amount of extra sugar in the urine, which is largely derived from muscle glycogen. One may conclude that epinephrine is able to maintain an elevation of the blood sugar level partly by accelerating the breakdown of liver glycogen and partly by accelerating the transformation of muscle glycogen to lactic acid, which serves as a source of new carbohydrate.

The mobilization of glycogen by epinephrine is of importance during hypoglycemia. It has been shown that hypoglycemia evokes an increased discharge of

52. Cori, C. F., and Buchwald, K. W.: *Am. J. Physiol.* **95**: 71, 1930.

53. In hypophysectomized animals the absorption of subcutaneously injected epinephrine hydrochloride is so slow that hardly any hyperglycemia occurs; intravenous injection of the drug has the same hyperglycemic action in these animals as in normal animals (Russell, J. A., and Cori, G. T.: *Am. J. Physiol.* **119**: 167, 1937).

54. Ergot alkaloids inhibit glycogenolytic action in the liver but have no effect on lactic acid formation in muscle.

55. Cori, C. F.: *Endocrinology* **26**: 235, 1940.

56. Hegnauer, A. H., and Cori, G. T.: *J. Biol. Chem.* **105**: 691, 1934.

epinephrine from the adrenals.<sup>57</sup> Animals with denervated adrenals are hypersensitive to the hypoglycemic action of insulin; convulsions are produced with smaller doses and the original blood sugar level is regained more slowly than in animals in which the mechanism for the discharge of epinephrine is intact. These experiments demonstrate the participation of epinephrine in the regulation of the blood sugar level under conditions of stress. Under more normal conditions medulladrenalectomized and sympathectomized dogs are able to regulate their blood sugar as efficiently as animals that have not been operated on.<sup>58</sup>

Epinephrine increases the oxygen consumption from 15 to 30 per cent in the fasting, in the postabsorptive and in the dextrose-fed animal. In the first the extra calories are derived exclusively from oxidation of fat; in the postabsorptive animal, in which a mixture of carbohydrate and fat is being oxidized, epinephrine also increases the metabolism without much change in the proportion of the foodstuffs burned. During absorption of dextrose in previously fasting rats epinephrine actually decreases oxidation of carbohydrate and the extra calories are furnished by oxidation of fat. The calorogenic action of epinephrine may represent, in part at least, the cost of reconversion of lactic acid to carbohydrate, a process which is known to require energy.<sup>48</sup>

	Liver Glycogen	Glycogen in Rest of Body	Tissue Sugar	Carbo- hydrate Oxidized	Blood Sugar per 100 Cc.
Controls .....	—49	—167	—22	220	—45
Epinephrine ....	+26	—298	+8	263	+16
Insulin .....	—141	—188	—47	434	—89

The elevation of the blood sugar level during epinephrine action does not signify that oxidation of carbohydrate is correspondingly increased.<sup>59</sup> In man, Conn and associates<sup>60</sup> found that at a blood sugar level of 200 mg. per hundred cubic centimeters produced by injection of epinephrine hydrochloride, less dextrose was oxidized than when no epinephrine was given and the blood sugar was 80 mg. per hundred cubic centimeters. When the blood sugar was raised to the same level in one instance by injecting epinephrine hydrochloride and in another by feeding dextrose, twice as much sugar was oxidized in the latter as in the former case. Courtice and co-workers<sup>61</sup> found that in man under postabsorptive conditions epinephrine hyperglycemia is not associated with an increase in oxidation of sugar, and the same result was obtained by Dill and collaborators.<sup>62</sup> Lundsgaard and associates<sup>63</sup> reported that the increase in utilization of dextrose which occurs in a perfused hind limb preparation of a dog at a high blood sugar level is prevented by epinephrine.

The difference in the action between epinephrine and insulin is illustrated in the following experiments, in which these substances were injected into rats immediately after the completion of absorption of a sugar

meal.<sup>64</sup> The changes which occurred during the first three hours after the injection are expressed in milligrams per hundred grams of rat.

Epinephrine, in spite of a raised level of blood sugar, has little effect on oxidation of carbohydrate and increases mainly the disappearance of muscle glycogen, which is partly oxidized and partly converted to lactic acid and hence to liver glycogen and blood sugar. Insulin doubles oxidation of carbohydrate, and the material drawn on is mainly blood sugar derived from liver glycogen. The opposite effects of epinephrine and insulin on the blood sugar level are clearly reflected in the rate at which blood sugar is oxidized in the tissues. Insulin enables the tissues to oxidize blood sugar at an increased rate, even when the concentration is below normal; epinephrine prevents the increase in oxidation of blood sugar which is normally associated with a rise in the concentration of this sugar.

Anesthetics, particularly barbiturates, greatly enhance the effect of epinephrine on the utilization of blood sugar, as shown in the following experiments. Unanesthetized rats metabolized 98 per cent, and when treated with epinephrine, 88 per cent, of the dextrose supplied them in four hours. During amytal anesthesia 91 per cent was utilized, but when epinephrine was injected during amytal anesthesia, only 33 per cent was utilized, and the rest of the sugar was excreted in the urine.<sup>65</sup> The mechanism by which barbiturates enhance the inhibitory effect of epinephrine on the utilization of dextrose is not known.

#### THERAPEUTIC USES OF EPINEPHRINE

Extensive use is made of the vasoconstrictor action of epinephrine hydrochloride; the drug is applied locally to congested mucous membranes and to bleeding surfaces; it is injected in combination with various local anesthetic agents to reduce blood flow through the tissues receiving the injection and thus to delay absorption. This use permits a minimal concentration of the anesthetic compound to be employed, reducing the danger of systemic effects; it also prolongs the duration of local anesthesia and reduces bleeding following incision.

Epinephrine usually gives relief in a variety of allergic disorders which are thought to be due to the liberation of a histamine-like substance; it counteracts the urticaria and other manifestations of serum sickness; it counteracts the acute circulatory disturbance (nitritoid crisis) which is sometimes seen following an injection of any of the arspenamines. In cases of angioneurotic glottis edema the drug may be life-saving. In asthmatic attacks epinephrine usually gives prompt relief, due to its dilator action on the bronchial musculature. In shock the drug is of little value, and may actually be harmful; the arterioles, on which epinephrine principally acts, are already maximally constricted as a result of the state of shock, while the constrictor action on the dilated capillaries is too feeble to displace the blood which stagnates in the splanchnic area.

Spectacular is its occasional successful use in resuscitating persons in whom the heart has apparently ceased to beat as a result of drowning, carbon monoxide poisoning or accidents during anesthesia. In such cases, justifying heroic measures, intracardiac injections of epinephrine hydrochloride have sometimes resulted in the initiation of cardiac contractions. Epinephrine is used in Stokes-Adams disease to increase the idioventricular rate.

64. Cori, C. F., and Cori, G. T.: *J. Biol. Chem.* **70**: 321, 1928.

65. Cori, G. T.: *Am. J. Physiol.* **95**: 285, 1930.

57. Cannon, W. B.; McIver, M. A., and Bliss, S. W.: *Am. J. Physiol.* **69**: 46, 1924.

58. Bronia, L.; Cannon, W. B., and Dill, D. B.: *J. Physiol.* **95**: 431, 1939.

59. The lactic acid formation results in a lowering of the carbon dioxide-combining power of the blood. Experiments in which respiratory metabolism is measured have to be extended to a time when the acid-base equilibrium has returned to the original level; or the proper corrections for the extra carbon dioxide given off have to be made.

60. Conn, J. W.; Conn, E. S., and Johnston, M. W.: *J. Nutrition* **19**: (supp.) 16, 1940.

61. Courtice, F. C.; Douglas, C. G., and Priestley, J. G.: *Proc. Roy. Soc. London, s. B* **127**: 41, 1939.

62. Dill, D. B.; Johnson, R. E., and Daly, C.: *Am. J. M. Sc.* **198**: 702, 1939.

63. Lundsgaard, E.; Nielson, N. A., and Øskov, S. L.: *Skandinav. Arch. f. Physiol.* **81**: 11, 1939.

## COUNCIL ON PHYSICAL THERAPY

JOUR. A. M. A.  
JUNE 7, 1941

Intravenous injections of epinephrine hydrochloride are potentially dangerous, particularly in patients with hypertension. The sudden rise in blood pressure may cause acute cardiac dilatation in a weakened heart; it may lead to rupture of internal hemorrhages; it is often followed by a prolonged period of low blood pressure. In animals, paralysis of the central nervous system and edema of the lung are terminal symptoms of an overdose of epinephrine, and similar symptoms have been observed in man. Under certain conditions injections of epinephrine hydrochloride have been shown to cause fatal ventricular fibrillation; best known of conditions predisposing to such an occurrence is light chloroform anesthesia.

Most of the desirable systemic actions of the drug can be secured by subcutaneous administration; this is safer than intravenous injection, and the action is of longer duration. It should be mentioned, however, that absorption of epinephrine hydrochloride from subcutaneous tissues may be deficient in persons with failing circulation. Massage of the injected area has a marked effect on the rate of absorption, as shown by the immediate blood pressure response. If a prolonged systemic action is desired, epinephrine suspended in oil may be injected subcutaneously or intramuscularly.<sup>66</sup> For certain therapeutic purposes, intravenous injection at a constant rate (in contrast to single intravenous injections) has been used but it requires a special apparatus, the addition of some stabilizer to prevent in vitro oxidation of the drug, and repeated control of blood pressure.

## Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS.  
HOWARD A. CARTER, Secretary.

## CONNELL GAS MACHINE DeLUXE TABLE MODEL ACCEPTABLE

Manufacturer: Connell Division, Ohio Chemical and Manufacturing Company, 1177-1199 Marquette Street, N.E., Cleveland.

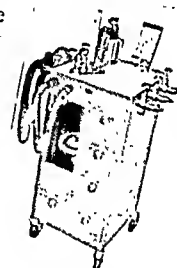
The Connell Gas Machine, DeLuxe Table Model, is designed for the administration of inhalation anesthesia by (a) "absorption in circuit" or (b) "absorption to-and-fro."

Cylinders of gases, D size or smaller, or piped gases under low pressure may be utilized in the apparatus. No automatic reducing valves are used. Leaks from cylinder to cylinder cannot occur. There are yokes for six gas supplies, each with its own control valve; two are labeled "oxygen," two are labeled "Filler—He, N<sub>2</sub>O, CO<sub>2</sub>" (helium, nitrous oxide, carbon dioxide) and two are labeled "Anesthetic—N<sub>2</sub>O, C<sub>2</sub>H<sub>6</sub>, C<sub>3</sub>H<sub>8</sub>" (Nitrous oxide, ethylene, cyclopropane). Three dry flowmeters are incorporated; one is for oxygen, reading to 1,000 cc. per minute in fine scale and thence to 8 liters per minute on the coarse scale, and the second meter measures the "Filler—He, N<sub>2</sub>O, CO<sub>2</sub>" (helium, nitrous oxide, carbon dioxide). The third meter measures the anesthetic agent and has a reversible scale reading to 800 cc. per minute for cyclopropane on both sides, to 10 liters per minute on one side for ethylene, and to 10 liters per minute on the opposite side for nitrous oxide. From the tube of the breathing circuit built into the apparatus. When the to-and-fro absorber is used, the gases flow out this "inspiratory" tube by a single hose to the "to-and-fro absorption" unit. Very large, unmeasured amounts of gases may flow through the meters.

When used for carbon dioxide absorption in circuit, the progress of the respired atmosphere is as follows: Expired gases leave the face mask by one large tube, pass through a one-way gravity type flutter valve, thence through the soda lime canister, then through another one-way gravity type flutter valve through the inspiratory tube and back to the face mask. A drip-type ether vaporizer is attached to the inspiratory side of the circuit near the gas feed, the ether dripping onto a small plate in the large tube. The breathing bag is attached to the circuit between the soda lime canister and the gas feed. Two types of breathing bags are provided; one is a pendant bag of about 3 liters capacity, and the other an accordion type bag with the gas inlet at the bottom. By means of a rod attached to the top of the latter bag and projecting through the top of the apparatus, the tidal volume of breathing can be read against the scale, marked to 3 liters capacity. The soda lime canister is easily changed without interrupting anesthesia by loosening a thumb screw holding it in place with the gases shunted around the soda lime canister.

On the expiratory tubing, on the table top, is a blow-off valve which can be set for gas escape at 3, 6, 12 or 38 mm. of mercury pressure. This valve is adjustable by a series of weights.

Four drawers in the cabinet provide for storage of supplies—a spare soda lime canister, wrenches for opening gas cylinders, and a graduated series of weights which can be placed on top of the spirometer (accordion type) bag to exert pressure automatically on inspiration (giving pressures equivalent to 2, 4 and 6 mm. of mercury or combinations thereof). The tubing between unit and mask is the kink-proof type of not less than 2 cm. diameter. The Y piece connecting tubing to the mask has a shunt which allows the patient to breathe air while the mask is being fitted to the face without loss of gases. Two sizes of all rubber masks were submitted with the unit, one labeled "child size" (having a net dead space of 100 cc.) and one labeled "standard size" (having a net dead space of 125 cc. when in position on the face).

Connell Gas Machine,  
DeLuxe Table Model.

For use with to-and-fro methods of carbon dioxide absorption, a separate coupling and small outlet tube are provided which slip onto the "inspiratory" outlet. To this, the usual to-and-fro mask, canister and bag may be attached. The arrangement of valves makes it unnecessary to plug the "expiratory" outlet.

Resistance to breathing is in the order of 1.6 cm. of water pressure on inspiration and on expiration with the pendant type breathing bag in place. With the spirometer type breathing bag the resistance to expiration is approximately 2 cm. of water pressure, but the weight of the spirometer bag reduces the inspiratory resistance to zero. With the graduated series of weights placed on top of the spirometer bag, the resistance to expiration was shown to be increased by the amount of the weights used and inspiration facilitated by the same amount. The 600 Gm. of soda lime contained in the canister for circuit absorption has a useful life of about six to seven hours before clinical evidence of carbon dioxide excess appears. It must be recognized that carbon dioxide absorption units of either circuit or to-and-fro types in use today do not reduce carbon dioxide in the inspired atmosphere to zero.

Resistance to breathing in the circuit with the pendant type bag is about 35 per cent greater than with Waters' to-and-fro absorption unit. The resistance to expiration with the spirometer bag is 67 per cent greater than with the to-and-fro absorption unit.

In the hands of the skilled anesthetist, the aforementioned gases and their combinations with ether may be efficiently and safely administered, provided the usual precautions known to skilled anesthetists are employed.

A comprehensive booklet of instructions, covering the care of the machine and a description of its mechanics, was submitted. The Council voted to accept the Connell Gas Machine, DeLuxe Model, for inclusion on the Council's list of accepted devices.

66. Keeney, E. L.: Bull. Johns Hopkins Hosp. 62: 227, 1938; Am. J. M. Sc. 198: 815, 1939.

**VACOLITE VACUUM TUBE HEARING  
AID ACCEPTABLE**

Manufacturer: Vacolite Company, 3003 North Henderson Street, Dallas, Texas.

The Vacolite Vacuum Tube Hearing Aid consists of the following parts:

(a) Combined microphone and vacuum tube amplifier No. 1073, with a control knob on top of the case and an on-and-off contact on the side of the case. The back of the instrument carries a slotted screw for adjusting the frequency response of the instrument. Instruction sheets submitted with the instrument state that setting of this screw changes the response. This unit is enclosed in a molded bakelite case,  $3\frac{1}{2}$  by  $2\frac{1}{4}$  by  $1\frac{1}{4}$  inches, weighing 210 Gm. Control knob and connector plug give maximum dimensions of  $4\frac{1}{4}$  by  $2\frac{1}{4}$  by  $1\frac{1}{4}$  inches.



Vacolite Vacuum Tube Hearing Aid.

(b) A and B batteries incorporated in a single cardboard container holds Vacolite Audio Battery Supply No. 23, containing specially made batteries. Battery replacements can presumably be secured through the manufacturers. Two leads, one from the A and one from the B battery, are supplied. The battery unit is  $4\frac{3}{8}$  by 3 by  $1\frac{3}{16}$  inches over all and weighs 327 Gm.

(c) Crystal receiver,  $\frac{3}{16}$  inches thick by 1 inch diameter. The instrument was investigated by the Council in an acceptable laboratory. This investigation revealed:

**Battery Drain.**—The A battery was a single  $1\frac{1}{2}$  volt cell drawing on the instrument submitted 70 milliamperes. The B battery voltage was 34 volts and drew 0.70 to 0.80 milliamperes.

**Amplification.**—The following over-all amplifications at different frequencies were shown with volume control set for full volume:

Frequency	Cycles Per Second					
	128	256	512	1,024	2,048	4,096
At normal ear threshold, frequency control set in extreme counter clockwise position....	nil	?	18	44	38	19 db.
The same, frequency control set at extreme clockwise position .....	nil	?	10	40	36	19 db.
At approximately 45 decibels above normal threshold frequency control .....	nil	?	7	20	24	5 db.

**Electrical and Mechanical Features.**—Electrically the instrument seems to be quite satisfactory. It is quiet and not unduly sensitive to mechanical shocks. It is not subject to feedback squeals with a well fitted earpiece.

The Council on Physical Therapy voted to accept the Vacolite Hearing Aid for inclusion on its list of accepted devices.

**DeVILBISS NO. 147 ELECTRIC STEAM  
VAPORIZER ACCEPTABLE**

Manufacturer: The DeVilbiss Company, Toledo, Ohio.

The DeVilbiss No. 147 Electric Steam Vaporizer is used to supply medicated vapor. It is constructed of aluminum, has a flat percolator-type heating unit placed under the water compartment, is mounted on a base plate having thermoplas feet and is insulated to avoid burning the furniture if it boils dry. The unit operates on alternating or direct current, 110-115 volts.

Cotton is placed in a receptacle in the cover of the unit and is saturated with medicament. The firm states that steam is produced in fifteen minutes and that the unit steams one hour and twenty minutes without refilling.

The Council voted to accept the DeVilbiss No. 147 Electric Steam Vaporizer for inclusion on its list of accepted devices.



DeVilbiss No. 147 Electric Steam Vaporizer.

**Council on Pharmacy and Chemistry****REPORTS OF THE COUNCIL**

THE COUNCIL HAS AUTHORIZED THE FOLLOWING STATEMENT FOR PUBLICATION. OFFICE OF THE COUNCIL.

**ANTIPNEUMOCOCCIC SERUMS**

As soon as the evidence submitted seemed to warrant, the Council accepted certain types of antipneumococcic serum; viz., types I, II, IV, V, VII and VIII. These were horse serum preparations. Subsequently the Council accepted the same types of serum as produced in the rabbit.

The remaining generally recognized types of serum have not been accepted by the Council, since adequate volume of clinical data had not been submitted to warrant acceptance, though it was regarded as possible that ultimately most of the other types would be accepted.

At the annual meeting of the Council in March 1940 the situation was again canvassed; as a result it was decided to accept type III antipneumococcic serum (rabbit). The evidence submitted by one manufacturer (Lederle Laboratories, Inc.) indicated that among 91 cases treated with type III rabbit serum there were 18 deaths (20 per cent mortality). There were no strictly comparable control cases, but among 18 cases of type III pneumonia treated without serum there were 11 deaths (61 per cent). The difference in case fatality rates in these series of cases and the evidence presented by clinical members of the Council appeared to warrant the acceptance of type III antipneumococcic serum (rabbit). As evidence accumulates for other types, they will be again considered.

**NEW AND NONOFFICIAL REMEDIES**

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

OFFICE OF THE COUNCIL.

**ANTIPNEUMOCOCCIC SERUM, TYPE III (FROM RABBITS).**—An antiserum obtained from the blood of an animal of the genus *Lepus*, containing predominantly antibodies to type III pneumococcus (*Diplococcus pneumoniae*).

**Dosage.**—Average dose, 20,000 to 100,000 units intravenously. The initial and subsequent dosage should be administered in such amount and at such intervals as indicated by the condition of the patient, according to the judgment of the physician. With a large initial dose, fewer units may be curative. The Francis cutaneous test (injection of specific pneumococcic capsular polysaccharide) may be used in conjunction with clinical observations to determine adequacy of dosage.

**SODIUM CITRATE 3% W/V SOLUTION-ABBOTT.**—A sterile 3 per cent solution of sodium citrate in distilled water contained in a specially adapted bottle which can be equipped with an accompanying rubber bulb attachment to assist the inflow of liquids.

**Actions and Uses.**—An anticoagulant for indirect blood transfusion and for the preparation of blood plasma. The flow of blood from the needle in the donor's vein into sterile citrate solution of the container is assisted by manipulation of a rubber bulb attachment. The blood is administered to the recipient by gravity flow and is completely filtered.

**Dosage.**—50 cc. of the solution is used for each 450 cc. of whole blood.

Manufactured by Abbott Laboratories, North Chicago, Ill. No U. S. patent or trademark.

**Sodium Citrate 3% W/V Solution-Abbott, 50 cc. in 500 cc. Bottle:** Contains 3 per cent sodium citrate in distilled water.

**SODIUM CITRATE.**—"Contains not less than 10 per cent and not more than 13 per cent of water." U. S. P.

For standards see the U. S. Pharmacopeia under Sodii Citras.

**SULFAPYRIDINE** (See New and Nonofficial Remedies, 1940, p. 494).

The following dosage form has been accepted:

**Tablets Sulfapyridine-National Drug Co., 0.5 Gm. (7.7 grains).**

Prepared by the National Drug Co., Philadelphia. No U. S. patent or trademark.



in Rome. Kupka and Bennett<sup>2</sup> report 17 cases, and Weber,<sup>3</sup> Schuberth<sup>4</sup> and Grass<sup>5</sup> each report a small number of cases. The consensus is uniformly favorable. However, final evaluation is not possible at present. Whether or not the apparent healing of the cavities is permanent must await further observations.

### Current Comment

#### WORK OF THE ROCKEFELLER FOUNDATION IN 1940

Each year the review of the work of the Rockefeller Foundation reflects the progress of endeavor in many fields spread over almost the entire world. The 1940 review presented by the president of the foundation, Raymond B. Fosdick,<sup>1</sup> is tragic in its record of the fate of learning throughout much of the world. The development of the war has forced many scholars into exile, it has forced others to give up their intellectual work, and still others have completely disappeared from sight. The Paris office of the foundation has been closed and the Shanghai office transferred to Manila. The personnel of the foundation has had to be recalled from Egypt, where work was being carried on in malaria and schistosomiasis, and from Turkey, where work in sanitary engineering was being pursued. Likewise the personnel of the foundation had to be removed from Rumania, where scarlet fever studies were being conducted, and from Hungary, which was a station for influenza research. In the face of such developments the foundation has had to reallocate many of its funds. Appropriations have been granted for the establishment and continued work, so far as possible, of eminent refugee scholars; a plan has been initiated and funds have been appropriated for continuation of training in this country of British medical students. Health programs which will be pursued as much as circumstances allow have been initiated by sending a health commission to Europe under the direction of Dr. W. A. Sawyer of the International Health Division. Elsewhere some of the work of the foundation has achieved greater success: progress has occurred in the development of prophylactic measures against influenza; the battle against the *Anopheles gambiae* mosquito in Brazil has made much progress; there have been further developments in unraveling the yellow fever mystery, and the foundation has aided in the establishment of a new school of public health at the University of Michigan. Outside the medical field also the foundation has continued its appropriations and encouragement toward the intellectual life of the world. Its appropriations for 1940 included some transfers from the principal fund of the foundation. Fosdick's report is a moving document which illustrates the attempt of intellectual life to survive under adverse circumstances.

2. Kupka, E., and Bennett, E. S.: Monaldi's Suction Aspiration of Tuberculous Cavities, *Am. Rev. Tuberc.* 42: 614 (Nov.) 1940.

3. Weber, H.: Saugdrainageverfahren zur Heilung tuberkulöser Kavernen in der Lunge, *Ztschr. f. Tuberk.* 84: 19 (Dec.) 1939.

4. Schuberth, A.: Die Behandlung der tuberkulösen Kaverne mit der Kavernensaugdrainage, *Ztschr. f. Tuberk.* 84: 185 (Feb.) 1940.

5. Grass, H.: Ueber Kavernenheilung durch Saugdrainage nach Monaldi, *Ztschr. f. Tuberk.* 84: 1 (Dec.) 1939.

1. Fosdick, R. B.: The Rockefeller Foundation: A Review for 1940.

#### SALT IN HOT INDUSTRIES

The amount of sweat excreted by workers in hot industries is known to be prodigious, at times amounting to several pints an hour. Consumption of water alone to replace abnormal loss of body fluids leads to the condition commonly referred to by miners and furnace workers as "water poisoning." Present day knowledge of water and metabolite balance has demonstrated that the symptoms of heat cramp or heat exhaustion are not the result of overconsumption of water but rather the serious depletion of chlorides. Normally, a man needs a daily intake of from 8 to 15 Gm. of salt to make up for chlorides eliminated in the urine and sweat. In case of excessive perspiration, considerably larger amounts of salt are required to maintain proper balance. The practice of supplying industrial workers with salt, therefore, in hot industries and in hot weather rests on sound physiologic principles. Close observation by many industrial physicians indicates that harmful results need not be expected in otherwise healthy men if there is rough approximation between salt loss and salt replacement. Many industries because of convenience provide salt tablets by dispenser to be taken by the worker with each drink of water. Dextrose is frequently incorporated in the tablet on the assumption that a quick energy source is provided and that it is of value in combating shock associated with heat exhaustion. Actually, blood sugar levels in hot industry workers are not found to be measurably altered.

#### MATERNAL MORTALITY IN THE SOUTH

Economic causes are fundamentally responsible for high maternal mortality in the South concludes Dr. James R. McCord<sup>1</sup> in his presidential address before the fifty-third annual meeting of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons. The basis of his remarks was a careful analysis of ninety-seven maternal deaths of Negro women; 37 per cent of the immediate responsibility for these preventable deaths was assigned by him to the hospital doctor, an equal percentage to the patient, 12 per cent to hospital routine, 10 per cent to an outside doctor and only 4 per cent to a midwife. Nearly 60 per cent of the obstetric deaths were from sepsis, but he concludes that "half of these deaths from sepsis were not preventable with the present economic and intellectual environment of the patients." Neglect of this factor has been responsible for much misleading discussion of maternal mortality in the South. Some of the concluding comments of Dr. McCord provide vivid factual support for these conclusions:

"Illiteracy is four times as prevalent in the South as in the rest of the nation. The average expenditure on education per child is about half that of the country as a whole. . . . The South must educate one third of the nation's children with one sixth of the nation's school revenues. . . . The South collects about half as much per person in taxes as does the nation as a whole, but she devotes a larger share of her income to schools. . . . The average farm income in the South is \$186 as compared to \$528 elsewhere. . . . The poorest rural area in America has the greatest number of people. The birth rate of the South exceeds that of any other region."

1. McCord, J. R.: Presidential Address, *Am. J. Obst. & Gynec.* 41: 355 (March) 1941.



# MEDICAL PREPAREDNESS

*In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.*

## RECREATIONAL CENTERS FOR SOLDIERS

The War Department has selected five more sites for army recreational camps and it plans to extend the program to all training areas when funds are available. Seven recreational camps had previously been established along the Gulf Coast. The sites of the five new camps tentatively selected are at Jacksonville Beach and St. Augustine, Fla., Savannah, Ga., Charleston, S. C., and Wilmington, N. C. The seven original recreational camps or week-end tent cities are at Mobile, Ala., Biloxi, Pascagoula, and Gulfport, Miss., New Orleans, and Panama City and Pensacola, Fla. The present leave-camps are far different from those of World War days. The camps are on sites accessible to downtown areas, and recreation and amusement facilities are available from which the soldier can select or write his own ticket of fun. The purpose of these recreational areas, however, is not only to give the soldier a good time, but it has a definite morale building objective. There are no formations, no roll calls, no reveille. The expenses at the recreational camps are small. Food is obtainable from a concessionaire on the grounds at low cost, and meals in these areas should average from 15 to 30 cents. The civilian populations are extending full hospitality to the soldiers at these camps, and only in case of breach of discipline or where necessary to the interest of the community are the movements of an individual soldier restricted. While the recreational plan is just getting into its stride, facilities are now available to accommodate more than three thousand men weekly at these soldier resorts, and these are to be much increased.

## RECOMMENDED DAILY ALLOWANCES FOR SPECIFIC NUTRIENTS

In connection with the preparedness program a subcommittee of the Committee on Food and Nutrition of the National Research Council has prepared the accompanying table of recommended daily allowances for specific nutrients, together

with some appended notes. This may well serve as a guide on specific dietary needs not only for physicians but also for the general public.

## EXAMINATIONS FOR NURSES FOR NATIONAL DEFENSE

The U. S. Civil Service Commission announces two new examinations in the medical and nursing fields. Public health nursing consultant positions, paying \$2,600 and \$3,200 a year, are open in the U. S. Public Health Service. Nursing consultants will advise and consult with state health administrators as to the organization and administration of public health nursing within the respective states. They will also assist public health nursing directors in planning staff education programs and in demonstrating the conduct of institutes for groups of nurses. This examination is open only to registered graduate nurses who have finished a four year college course, including or supplemented by one year of study in public health nursing. Applications will not be accepted after July 26.

Applicants will be accepted until further notice for physicians as medical technicians, paying from \$1,620 to \$2,000 a year, and as junior laboratory helper at \$1,440 a year. Persons applying for the full or assistant grade of medical technician may qualify also in surgery. Applicants must have had at least fourteen units of high school study; otherwise they must pass a written general test. Appropriate experience in this field also is required.

The U. S. Civil Service Commission has also reannounced examinations for junior grade nurse at \$1,620. Applicants will not be required to take a test, and the vision requirement has been modified.

Persons interested and qualified for any of these positions should apply to the U. S. Civil Service Commission, Washington, D. C. Application forms may be obtained at any first or second class post office.

*Recommended Daily Allowances for Specific Nutrients*  
Committee on Food and Nutrition, National Research Council

	Calories	Protein, Gm.	Calcium, Gm.	Iron, Mg.	A,* International Units	Thiamine (B <sub>1</sub> ),† Mg.	Ascorbic Acid (C),‡ Mg.	Riboflavin, Mg.	Nicotinic Acid, Mg.	D, International Units
<b>Man (70 Kg.)</b>										
Moderately active.....	3,000	70	0.8	12	5,000	1.8	75	2.7	18	
Very active.....	4,500	..	..	..	.....	2.3	..	3.3	23	‡
Sedentary.....	2,500	..	..	..	.....	1.5	..	2.2	15	
<b>Woman (55 Kg.)</b>										
Moderately active.....	2,500	60	0.8	12	5,000	1.5	70	2.2	15	
Very active.....	3,000	..	..	..	.....	1.8	..	2.7	18	‡
Sedentary.....	2,100	..	..	..	.....	1.2	..	1.8	12	
Pregnancy (latter half)...	2,500	85	1.5	15	6,000	1.8	100	2.5	18	400-800
Lactation.....	3,000	100	2.0	..	8,000	2.3	150	3.0	23	400-800
<b>Children up to 12 years</b>										
Under 1 year §.....	100 per Kg.	5-4 per Kg.	1.0	6	1,500	0.4	30	0.6	4	400-800
1-3 years.....	1,200	40	1.0	7	2,000	0.6	35	0.9	6	
4-6 years ¶.....	1,600	50	1.0	8	2,500	0.8	50	1.2	8	
7-9 years.....	2,000	60	1.0	10	3,500	1.0	60	1.5	10	‡
10-12 years.....	2,500	70	1.2	12	4,500	1.2	75	1.8	12	
<b>Children over 12 years</b>										
Girls—13-15 years.....	2,800	80	1.3	15	5,000	1.4	80	2.0	14	
16-20 years.....	2,400	75	1.0	15	5,000	1.2	80	1.8	12	‡
Boys—13-15 years.....	3,200	85	1.4	15	5,000	1.6	90	2.4	16	
16-20 years.....	3,800	100	1.4	15	6,000	2.0	100	3.0	20	‡

These are tentative allowances toward which to aim in planning practical dietaries. These allowances can be met by a good diet of natural foods; this will also provide other minerals and vitamins, the requirements for which are less well known.

\* Requirements may be less than these amounts if provided as vitamin A, greater if chiefly as the provitamin carotene.

† One mg. of thiamine equals 333 international units; 1 mg. of ascorbic acid equals 20 international units (1 international unit equals 1 U. S. P. unit).

‡ Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimal amounts recommended for infants.

§ Needs of infants increase from month to month. The amounts given are for approximately 6 to 18 months. The amounts of protein and calcium needed are less if from breast milk.

¶ Allowances are based on the middle age for each group (as 2.5, 5 and so on) and for moderate activity.

## EXAMINATIONS FOR APPOINTMENTS IN MEDICAL CORPS OF NAVY

The next examination for appointments as assistant surgeon, U. S. Navy (lieutenant [junior grade], Medical Corps, U. S. Navy) will be held at all major Medical Department activities on August 11 to 15 inclusive. Applications for this examination must be in the Bureau of Medicine and Surgery not later than July 15.

Applicants for appointment as assistant surgeon must be citizens of the United States, more than 21 but less than 32 years of age at the time of acceptance of appointment, and graduates of a class A medical school who have completed at least one year of intern training in a hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association.

A circular of information listing physical and other requirements for appointment, subjects in which applicants are examined, application forms and other data pertaining to salary, allowances and so on may be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., on request.

An examination for appointment as acting assistant surgeon for intern training in naval hospitals accredited for intern training by the Council on Medical Education and Hospitals will be held at all major Medical Department activities on

June 23 to 26 inclusive. Students in class A medical schools who will complete their medical education this year are eligible to apply for these appointments.

Students in class A medical schools who will have completed their third year of medical education this year are eligible to take this examination and, if successful, will receive their appointments on or about July 1, 1942, after they have completed their medical education.

Applicants for appointment as acting assistant surgeon for intern training must be citizens of the United States, more than 21 but less than 32 years of age at the time of acceptance of appointment. Acting assistant surgeons are appointed for a period of eighteen months. After the appointee has served as an intern in a naval hospital for twelve months he is eligible for and may take the examination for appointment as assistant surgeon, U. S. Navy.

A circular of information listing physical and other requirements for appointment as acting assistant surgeon, subjects in which applicants are examined, application forms and so on may be obtained from the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., on request.

Assistant surgeons and acting assistant surgeons for intern training are appointed in the rank of lieutenant (junior grade), Medical Corps, U. S. Navy. The pay and allowances for an officer of this rank total \$2,699 a year if he has no dependents and \$3,158 a year if he is married or has dependents.

## ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY WAR DEPARTMENT

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ABRAMS, Edward William, 1st Lieut., Portland, Ore.  
ALBRITTON, Andrew Stirling, 1st Lieut., New Orleans.  
BERG, Richard Fredrick, Captain, Portland, Ore.  
BOYLSTON, George Arthur, 1st Lieut., Wilmette, Ill.  
CHAMBERLIN, Donald Tillinghast, Captain, Boston.  
CHENEY, William Swartz, 1st Lieut., Baltimore.  
COOPER, Harold John, Captain, Fresno, Calif.  
DERRIG, Raymond Edwin, 1st Lieut., Washington, D. C.  
EBERHARD, Theodore Philip, 1st Lieut., Columbia, Mo.  
EIGENBROD, Frederick August, 1st Lieut., New Orleans.  
GOTTlieb, Jacob Daniel, Captain, Talmage, Calif.  
GRIFFIN, Lawrence Lafayette, 1st Lieut., Galveston, Texas.  
HAYNES, Walter George, 1st Lieut., Chicago.  
HEALY, Martin Joseph, Jr., 1st Lieut., New York.  
HEWITT, Perry Edwin, Jr., 1st Lieut., Muskogee, Okla.  
HOLOUBEK, Joe Edward, 1st Lieut., New Orleans.  
HORN, Leonard, 1st Lieut., Rochester, N. Y.

JAMES, Alfred Elmore, 1st Lieut., Beavertown, Pa.  
KELLOGG, Frederick, Captain, Long Beach, Calif.  
McCULLOUGH, John Davis, 1st Lieut., East Knoxville, Tenn.  
MINNETT, John Sables, Captain, Dallas, Texas.  
MIRA, Anthony Agathon, 1st Lieut., Corona, N. Y.  
NELSON, Donald C., Captain, Fort Defiance, Ariz.  
PODESTA, Joseph John, 1st Lieut., Cincinnati.  
SCHULTZ, Abraham, 1st Lieut., Chicago.  
SNYDER, Rufus Adam, 1st Lieut., Chicago.  
SPELLBERG, Mitchell Abraham, 1st Lieut., Chicago.  
STOLAR, Robert, 1st Lieut., Washington, D. C.  
SULLIVAN, Clement Joseph, Captain, St. Louis.  
VORISEK, Elmer Albert, 1st Lieut., Oak Park, Ill.  
WALLACE, Joseph James, 1st Lieut., Washington, D. C.

### Orders Revoked

HILL, Thurman K., 1st Lieut., Nashville, Tenn.  
JONES, Harry D., 1st Lieut., Nashville, Tenn.  
KOLCZUN, Michael C., 1st Lieut., New Orleans, La.  
LUTHER, Ross Daniel, 1st Lieut., Denver.  
MORGAN, Edward S., 1st Lieut., Pendleton, Ore.

## THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

BAILEY, William Otis, Jr., 1st Lieut., Leesburg, Va., Fort George G. Meade, Md.  
BARNES, Earl Bower, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
BEERMAN, Curtis Arthur, 1st Lieut., Altoona, Pa., Fort George G. Meade, Md.  
BENZON, George Henry III, 1st Lieut., Jenkintown, Pa., Fort George G. Meade, Md.  
BIGLEY, Joseph Robert, 1st Lieut., Philadelphia, Fort George G. Meade, Md.  
BRINDISI, Gaetano, 1st Lieut., Philadelphia, Fort George G. Meade, Md.  
BURGESS, Forbes Hathaway, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
CALL, Manfred III, 1st Lieut., Richmond, Va., Fort George G. Meade, Md.  
CANTOR, Paul David, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
CHISTNUT, John Letcher, 1st Lieut., Mountain Grove, Va., Fort George G. Meade, Md.  
DODD, William Anthony, 1st Lieut., Baltimore, Fort George G. Meade, Md.  
FARNSWORTH, David Ivan, 1st Lieut., Richmond, Va., Fort George G. Meade, Md.  
FIORE, Charles Nicholas, 1st Lieut., Brentwood, Md., Fort George G. Meade, Md.

FLOCKS, Milton, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
HANNA, Michael Ignatius, 1st Lieut., Covington, Va., Fort George G. Meade, Md.  
HEIGES, Harold Lynwood, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
HEIMOFF, Leonard Lincoln, 1st Lieut., Baltimore, Fort George G. Meade, Md.  
HIGSTEIN, Benjamin, 1st Lieut., Baltimore, Fort George G. Meade, Md.  
KRAMI, August Herman, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
MARTIN, Carroll James, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
McCONNELL, Frederick Gray, 1st Lieut., Gate City, Scott County, Va., Camp Davis, N. C.  
McMAHON, John Martin, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
NELMS, Nowell Darden, 1st Lieut., Mathews, Va., Fort George G. Meade, Md.  
O'BRIEN, James Nester, 1st Lieut., Harrisburg, Pa., Fort George G. Meade, Md.  
PROKOP, Albert George, 1st Lieut., Clairton, Pa., Fort George G. Meade, Md.  
RATCLIFFE, Harold Elton, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
SNOW, Lee Bruner, 1st Lieut., Washington, D. C., Fort George G. Meade, Md.  
STEHRMAN, Vernon Andrew, 1st Lieut., Arlington, Va., Fort George G. Meade, Md.  
VARNER, Winter Thomas, 1st Lieut., Richmond, Va., Fort George G. Meade, Md.  
WALKE, John Talb, 1st Lieut., Norfolk, Va., Fort George G. Meade, Md.

WARE, Robert Barnes, 1st Lieut., Lynchburg, Va., Fort George G. Meade, Md.  
WILKINS, Jesse Lee, 1st Lieut., Pocomoke City, Md., Fort George G. Meade, Md.  
WILLIAMS, Ben Clayton, 1st Lieut., Baltimore, Fort George G. Meade, Md.  
TURNER, Phillip Rorison, 1st Lieut., Takoma Park, Md., Fort George G. Meade, Md.

#### Orders Revoked

AXELMAN, Edward Lewis, 1st Lieut., Darby, Pa.  
BAUSCHER, Abner H., Lieut. Col., Reading, Pa.  
BOSS, Myron Theodore, 1st Lieut., Baltimore.  
CORLEY, Karl C., 1st Lieut., Chevy Chase, Md.  
DAPARMA, Frank L., 1st Lieut., Pittsburgh.  
DEAN, James S., Captain, Spring City, Pa.  
DEGNAN, Philip A., 1st Lieut., Washington, D. C.  
DOUGLAS, Harry S., 1st Lieut., Washington, D. C.  
ECKHARDT, John C., Lieut. Col., Washington, D. C.

### SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

ADELSON, Sidney L., 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.  
ALLISON, Olaf W., 1st Lieut., Danville, Ill., 27th Division, Fort McClellan, Ala.  
ANDERSON, Donald H., 1st Lieut., Greenville, Ill., 27th Division, Fort McClellan, Ala.  
ANDERSON, William H., 1st Lieut., San Francisco, Air Corps Basic Flying School, San Angelo, Texas.  
BERRY, Robert E. L., 1st Lieut., Detroit, 12th Station Hospital, Camp Forrest, Tenn.  
BOWEN, Robert E., 1st Lieut., Chicago, 27th Division, Fort McClellan, Ala.  
BOWERS, Paul A., 1st Lieut., Chicago, Air Base, Tucson, Ariz.  
BROCK, Clayton E., 1st Lieut., St. Louis, Station Complement, Camp Shelby, Miss.  
BUCKLEY, Clarence H., Captain, Menomonie, Wis., 10th Station Hospital, Camp Claiborne, La.  
CARR, James G., Major, Detroit, 12th Station Hospital, Camp Forrest, Tenn.  
COSTIN, Max, 1st Lieut., Chicago, Air Base, Tucson, Ariz.  
CRAMER, Oliver S., 1st Lieut., Detroit, Selfridge Field, Mich.  
CRISMON, Lester C., 1st Lieut., Chicago, 32d Division, Camp Beauregard, La.  
CULMER, Charles U., 1st Lieut., Iowa City, Air Base, Oklahoma City.  
DIAMONDSTONE, Albert H., 1st Lieut., Chicago, Station Complement, Camp Shelby, Miss.  
DILLON, Walter F., 1st Lieut., St. Louis, Station Complement, Camp Shelby, Miss.  
EHLERT, Charles D., Captain, Alton, Ill., Scott Field, Ill.  
FADEN, Gerson, 1st Lieut., Mowenaqua, Ill., Randolph Field, Texas.  
HAYRANEK, James C., 1st Lieut., Cicero, Ill., Chanute Field, Rantoul, Ill.  
JANCI, Julius S., 1st Lieut., Owosso, Mich., Station Complement, Camp Croft, S. C.  
JEDLICKA, Frank L., 1st Lieut., Cicero, Ill., Station Hospital, Fort Sill, Okla.  
KACZKOWSKI, Joseph C., Major, Chicago, 9th Station Hospital, Fort McClellan, Ala.  
KASABACI, Harry Y., 1st Lieut., Chicago, Station Complement, Camp Croft, S. C.  
KAYE, Raymond J., 1st Lieut., Palmyra, Mich., Station Complement, Camp Wheeler, Macon, Ga.  
KESERT, Meyer, 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.  
KIRK, Max Lee, 1st Lieut., Mount Vernon, Ill., 27th Division, Fort McClellan, Ala.  
KUDOLLA, Charles R., 1st Lieut., Chicago, Station Complement, Camp Polk, La.  
LARRABEE, Walter F., Jr., Chippewa Falls, Wis., Station Complement, Camp Wheeler, Macon, Ga.  
LEVAN, Arthur B., 1st Lieut., Chicago, Station Complement, Camp Polk, La.  
LURIE, Robert I., 1st Lieut., Saginaw, Mich., Station Hospital, Fort Bliss, Texas.  
MAIBAUER, Frederick P., 1st Lieut., Wyandotte, Mich., Air Base, Oklahoma City.

### ARMY VACANCIES FOR DIETITIANS

Approximately three hundred and fifty vacancies for dietitians exist in army hospitals, which now have one hundred and three dietitians on duty. A school for dietitians is conducted at the Army Medical Center, Washington, D. C. Since the requirements for entrance include graduation from a recognized college with a major course in dietetics and nutrition, the course is devoted mainly to procedure peculiar to the military service. The pay of dietitians is \$1,800 a year. In time of peace only female dietitians certified by the Civil Service Commission are employed in Army hospitals. In time of war, however, men

EINHORN, Nathan Harry, 1st Lieut., Philadelphia.  
FOCHT, William W., 1st Lieut., Lebanon, Pa.  
HARMEIER, John Watson, Captain, Pittsburgh.  
HOFFSTEIN, Louis D., 1st Lieut., Philadelphia.  
HULBERT, Richard Stephen, 1st Lieut., Washington, D. C.  
HUNTER, OSCAR BENWOOD, Major, Washington, D. C.  
JONES, Clement Russell, Jr., Captain, Dixmont, Pa.  
KELLY, Edward A., 1st Lieut., Washington, D. C.  
MAINZER, Francis S., Major, Huntingdon, Pa.  
MILLER, Cledith Aten, 1st Lieut., Wilkes-Barre, Pa.  
MILLER, Harry Archer, Captain, Baltimore.  
MINTEER, James W., Captain, Ridgway, Pa.  
O'BOYLE, James Patrick, 1st Lieut., Dunmore, Pa.  
ROBBINS, Leo E., 1st Lieut., Philadelphia.  
SHUBIN, Harry, 1st Lieut., Philadelphia.  
SILVER, Israel Oscar, 1st Lieut., Steelton, Pa.  
TOMPKINS, Pendleton Souther, Captain, Philadelphia.  
URIDEL, Frank Arthur, 1st Lieut., Newfoundland, Pa.  
WEBER, George Samuel, 1st Lieut., Waldorf, Md.

MARTIN, Forrest R., 1st Lieut., Decatur, Ill., Chanute Field, Rantoul, Ill.  
MATTHEI, Louis P., 1st Lieut., South Wayne, Wis., U. S. Army Induction Station, Milwaukee.  
MATZKIN, Lloyd L., 1st Lieut., Chicago, Station Complement, Fort Jackson, S. C.  
McALLISTER, Ralph G., Captain, DeKalb, Ill., 33d Division, Camp Forrest, Tenn.  
McNERTNEY, Francis D., Major, Bloomington, Ill., 5th Station Hospital, Camp Stewart, Ga.  
MILLER, Edward B., 1st Lieut., Chicago, Station Complement, Camp Polk, La.  
MILLS, Morton J., Captain, Chicago, U. S. Army Induction Station, Chicago.  
MULROONEY, Raymond E., 1st Lieut., Litchfield, Ill., Station Complement, Camp Polk, La.  
OLSON, James A., 1st Lieut., Flint, Mich., Selfridge Field, Mount Clemens, Mich.  
PRUSINSKI, Jerome C., 1st Lieut., Chicago, Station Complement, Fort Jackson, S. C.  
RAU, Frederick W., 1st Lieut., Saginaw, Mich., 24th Infantry, Fort Benning, Ga.  
REINARDY, Everett W., 1st Lieut., Burlington, Wis., Station Complement, Camp Wheeler, Macon, Ga.  
SCHICK, William R., 1st Lieut., Chicago, Air Base, Albuquerque, N. M.  
SCHROEDER, Charles M., 1st Lieut., Camp Grant, Ill., Station Complement, Fort Custer, Mich.  
SCHUMAN, Irving, 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.  
SCHULTZ, William J., 1st Lieut., Munising, Mich., Selfridge Field, Mount Clemens, Mich.  
SILVERSTEIN, Joseph, 1st Lieut., Chicago, Station Complement, Chanute Field, Ill.  
SPINKA, Isadore, 1st Lieut., Chicago, Station Complement, Camp Wheeler, Macon, Ga.  
SPRINGER, Eugene W., 1st Lieut., Iowa City, Air Base, Oklahoma City.  
SWANSON, George F., Captain, Newberry, Mich., 9th Station Hospital, Fort McClellan, Ala.  
SWENSON, Leland L., 1st Lieut., Grand Rapids, Mich., 27th Division, Fort McClellan, Ala.  
STOTZ, Kenneth F., 1st Lieut., Chicago, 33d Division, Camp Forrest, Tenn.  
TUROW, Irving L., 1st Lieut., Peoria, Ill., Station Hospital, Fort Custer, Mich.  
VAN NOORD, Gelmer A., 1st Lieut., Grand Rapids, Mich., 27th Division, Fort McClellan, Ala.  
WEDRAL, Jerry W., 1st Lieut., Cicero, Ill., 27th Division, Fort McClellan, Ala.  
WESCOTT, Royal J., 1st Lieut., Marquette, Mich., 11th Station Hospital, Fort Custer, Mich.  
ZLATKIN, Louis, 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.

#### Orders Revoked

BASSUENER, Reynold O., Captain, Warren, Wis.  
HIRSCHFELD, Alexander H., 1st Lieut., Ann Arbor, Mich.  
HUBBLE, William Fields, Jr., 1st Lieut., Decatur, Ill.  
PAISLEY, Alfred M., 1st Lieut., Jacksonville, Ill.  
PRUDOWSKY, Harry H., 1st Lieut., Milwaukee, Wis.  
ST. PIERRE, Roderick G., Captain, Portland, Ore.  
WEICHSELBAUM, Paul K., 1st Lieut., Chicago.

qualified as dietitians will be enlisted as technical sergeants as far as vacancies exist.

### NAVY ASSIGNMENTS NOT TO BE PUBLISHED

A recent order from the Secretary of the Navy restricts from general publication nomination of all officers of the Navy. Therefore, lists of the names of the United States Naval Reserve Officers reporting for active duty in the Navy, with the names of the stations to which they have been assigned, as published previously, will not be continued.

# ORGANIZATION SECTION

## OFFICIAL NOTES

### JUDGE PROCTOR IMPOSES SENTENCE

Following the trial of the U. S. Government versus the American Medical Association and other defendants on charges of violating the Sherman Anti-Trust Act and their conviction by a jury April 4, Justice James M. Proctor of the District Court in Washington, D. C., on May 29, imposed a fine of \$2,500 on the Association and a fine of \$1,500 on the Medical Society of the District of Columbia. The defense counsel announced that an appeal to the higher courts would be filed. The proceedings of the trial were published in various issues of THE JOURNAL beginning February 15.

### ADDRESSES BY OFFICIAL STAFF

DR. W. W. BAUER:

June 20—University of New Hampshire, Durham.

DR. MORRIS FISHBEIN:

June 17—Institute of Food Technologists, Pittsburgh.

June 26—Iowa and Illinois Central District Medical Association, Davenport, Iowa.

DR. FRANK H. LAHEY:

June 9—Massachusetts Institute of Technology, Cambridge.

June 11—Testimonial dinner to Dr. Fred Hussey, Providence, R. I.

June 24—Maine Medical Association, York Harbor.

DR. CARL M. PETERSON:

June 14—Utah State Medical Association, Salt Lake City.

June 19—Twin Lakes District Medical Society, Rockwell City, Iowa.

June 20—National Association of Manufacturers and the Associated Industries of Alabama, Birmingham.

DR. PAUL A. TESCHNER:

June 10—Friends of Rural Public Health Nursing, Norwood Park Township, Chicago.

## MEDICAL ECONOMIC ABSTRACTS

### SOCIAL SECURITY AND SICKNESS INSURANCE

The "Fifth Annual Report of the Social Security Board, 1940" contains several paragraphs directly or indirectly advocating the extension of social security legislation to cover the loss due to sickness. Pages 15 and 16 of the report say:

There is one major risk to economic security for which there is yet no provision in the social security program and only inadequate provision under other legislation—the risk of medical costs and of wage loss during illness or during temporary or permanent disability. In his capacity as a member of the Interdepartmental Committee to Coordinate Health and Welfare Activities, the chairman of the board has shared in the report and recommendations transmitted by that body to the President and the Congress. The board wishes to reiterate its endorsement of the goals and principles proposed in that report on a national health program.

Provisions to prevent sickness and maintain health and earning power and to offset the wage losses occasioned by disability are of direct moment to the programs already in operation. The present unemployment compensation laws and the funds they provide are designed to safeguard unemployed wage earners who are available for jobs. Yet there is obvious injustice in giving benefits to such workers and denying them to a worker who is out of a job because he is sick even though he may have had an identical record of past covered employment and may be suffering the same wage loss. It is impossible to face with equanimity the situation in the home of a worker who is insured under the federal old age and survivors' insurance system when he becomes sick or disabled, but dies after a period of disability during which his insured status has lapsed. If he had died before the end of that period, benefits which ordinarily are substantial in amount would have been payable to his children throughout their childhood and to his widow while she had such children in her care. With long-continued illness, however, in which costs of medical care are commonly beyond the resources of families of small means, there will often be a loss of these insurance rights and, in most such cases, a total loss of provision for the survivors. . . .

The board trusts that the Congress will be able to give early attention to the various measures that have been proposed for

safeguarding the health of the American people and averting or offsetting the economic distress caused by sickness and disability.

In the discussion of medical and institutional care (pages 100-101) the report says:

The inadequacy of provisions for the medical care of recipients of public assistance has continued to be one of the major problems confronting the state agencies and their local units. Increasing attention has been given to possible methods of meeting this need. During the fiscal year the board's consultants on medical problems and on medical social work visited sixteen states in which the state agencies had requested advice on specific problems in this field.

It is noted that:

Several states have suggested that the needs of recipients could be met more adequately if the federal government were willing to participate financially in payments to recipients for medical purposes.

However, the report concludes that

at least three major difficulties are present in attempting to meet the medical expenses of recipients of public assistance through regular allowances in the assistance payment. In the first place, it is obviously impossible to develop proper community medical facilities through the small additional amounts which might be included in the assistance plans made with recipients of public assistance, though in states and localities in which facilities are available for such services the inclusion of such allowances in the regular payments will permit wider and more effective use. In the second place, many types of medical needs are not predictable, and the expenses necessarily incurred may be of such magnitude that they must be met out of a special payment rather than through inclusion of an additional amount in the monthly public assistance payment. The third problem, which is of more fundamental significance, concerns the question whether the development of a program of medical care in connection with the three assistance programs under the Social Security Act would assist or hamper the development of a broader program of medical care for those groups in our population who are not now able to obtain needed services.

The Bureau of Research and Statistics of the board has undertaken health and disability studies concerning which the report says (page 140):

Studies of illness and disability as a cause of economic insecurity were continued during the year, and consideration was given to proposals for extending the social security system to include the risk of ill health and disability. Basic data were compiled and cost estimates were prepared for specific legislative programs under consideration by the Congress, and work was continued on the formulation of alternative specifications to be considered in the adoption of a program. Extensive analyses were made of American and foreign experience in order to provide a basis for estimating the extent and frequency of temporary and permanent disability to be anticipated under specified disability insurance programs. These studies have also included detailed analyses of the wage records of the old age and survivors' insurance program, in order to estimate the number of individuals with fully and currently insured status in future years.

Information has been collected concerning federal and state legislative proposals to provide medical services for various segments of the population. These proposals have been analyzed especially in their relationship to existing social insurance systems. Investigations of the extent and character of unmet medical needs have included studies of the receipt of medical services by urban and rural families in different income groups and expenditures by these groups for various types of medical services. On the basis of monthly reports submitted voluntarily by selected organizations, special studies are being undertaken to determine the volume and type of medical care furnished

under prepayment medical service plans and the personnel required for the operation of such plans. Consideration has been given to the analysis of methods for providing more nearly adequate medical care, especially through social insurance.

## REFERENDUM ON INSURANCE

A recent referendum on voluntary sickness insurance conducted by the West Virginia State Medical Association showed that 71 per cent favored some plan of voluntary sickness insurance, 28 per cent were against it and 1 per cent returned their ballots with comments but without voting. The vote is primarily 4 to 1 in favor of limiting coverage to the low income group. According to the *West Virginia Medical Journal* (37: 226 [May] 1941) it is expected that a proposal for some type of prepayment plan to be operated by the West Virginia State Medical Association will be considered at the next meeting of the house of delegates.

## HEALTH IN CANADA

The statisticians of the Metropolitan Life Insurance Company find that in spite of the war the Canadian death rate for 1940 among that company's Canadian industrial policyholders was 12.1 per cent lower than the average rate for the preceding five years and that the rate declined for practically every age among both men and women. The tuberculosis rate dropped 15 per cent as compared with the rate in the preceding five years. Violent deaths were also less in 1940 than in other recent years.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Change in Status.*—H. R. 4476 has been reported to the House, providing for sundry matters affecting the Military Establishment. As introduced, this bill provided, among other things, for the employment of interns in the Medical Department of the Army at not to exceed \$720 per annum. As reported, the bill would authorize the Secretary of War "to provide for the employment of interns who are graduates of or have successfully completed at least four years' professional training in reputable schools of medicine or osteopathy in the Medical Department, at not to exceed \$720 per annum."

*Bill Introduced.*—On May 14, the President requested additional funds for emergency and sanitation work of the United States Public Health Service, in the amount of \$1,235,000.

### STATE MEDICAL LEGISLATION

#### Florida

*Bills Introduced.*—S. 649 and H. 961 propose to enact a separate massage and physical therapy practice act and to create a board of massage and physical therapy examiners to examine and license applicants for licenses to practice massage and physical therapy. Section 8 of both bills reads as follows: "Massage and Physiotherapy Defined. For the purpose of this Act, massage is defined as follows: The Act of scientifically rubbing or kneading the soft superficial structures of the human body for the purpose of stimulating or restoring normalcy of circulation and tonicity of such structures, and for the relief of pain. In no way shall this Act interfere with the practice of osteopathy, chiropractic, or naturopathy, as is now governed by law. Applicant must, however, have elementary knowledge of anatomy, physiology and electrotherapeutics." H. 1416 proposes to enact a separate massage practice act and to create an independent state board of massage to examine and license applicants for licenses to practice massage. The bill provides that "the practice of massage is hereby declared a profession, and for the purpose of this Act is hereby defined as follows,

viz.: The scientific manual manipulation of the tissue and muscles of the human body, together with the skilful use of scientific apparatus usually associated with the practice of massage in administering such treatments as cabinet baths, turkish baths, reducing treatments, fomentations, natural and artificial heliotherapy, vibratory treatments and colonic-irrigations."

*Bill Passed.*—H. 1337 passed the House May 19, proposing to authorize the Board of County Commissioners of Clay County to levy on all taxable property an additional tax of two mills to care for the indigent inhabitants of that county who are in need of hospitalization and medical care.

#### Illinois

*Bills Introduced.*—H. 866 proposes to enact what it cites as the Illinois Food, Drug and Cosmetic Act to regulate the manufacture, sale, distribution and advertising of foods, drugs, cosmetics and therapeutic devices. H. 896 proposes to require each county to provide funds for the treatment of indigent persons afflicted with cancer or tumor.

#### Massachusetts

*Bill Introduced.*—H. 2528 proposes to prohibit the operation of a hospital or sanatorium unless licensed to do so by the state department of health.

#### Michigan

*Bill Introduced.*—H. 580 proposes to authorize the state council of health to establish and maintain a bureau of cancer control in the state department of health. The proposed bureau is to be authorized to promote measures to reduce the mortality from cancer by programs of education and by provision for necessary diagnostic laboratory work for persons financially unable to pay for the same. The proposed work of the bureau is not to be limited to public laboratories, but private laboratory facilities may be fully employed in those areas in which they are adequate and available.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ALABAMA

**State Medical Election.**—Dr. James M. Mason, Birmingham, was elected president of the Medical Association of the State of Alabama at its meeting in Mobile in April, succeeding Dr. Samuel A. Gordon, Marion. Dr. John Paul Jones, Camden, whose term as vice president expired this year, was reelected for another four year term. Others now serving as vice presidents are Drs. Roscoe C. Stewart, Sylacauga; John S. Tillman, Clio, and Merle E. Smith, Parrish. Montgomery was chosen as the place for the 1942 meeting.

### ARKANSAS

**Personal.**—Dr. Herbert H. McAdams has been elected president of the Jonesboro School Board and Dr. Walter C. Overstreet, vice president.—Dr. Leroy L. Fatherree has been chosen health officer of Little Rock.

**State Medical Election.**—Dr. Rufus B. Robins, Camden, was chosen president-elect of the Arkansas Medical Society at its recent annual meeting in Little Rock and Dr. Herbert Fay H. Jones, Little Rock, was inducted into the presidency, succeeding Dr. Henry T. Smith, McGehee. Other officers include Drs. Henry King Wade, Hot Springs National Park; Carl C. Hanchey, DeQueen, and Bonny N. Stevenson, West Memphis, vice presidents; Royal J. Calcote, Little Rock, treasurer, and William R. Brooksher, Fort Smith, secretary.

### CALIFORNIA

**State Medical Election.**—Dr. William R. Molony Sr., Los Angeles, was chosen president-elect of the California Medical Association at its annual meeting in May in Del Monte and Dr. Henry S. Rogers, Petaluma, was installed as president. Del Monte was again chosen as the place for the 1942 meeting, probably the first week in May.

**Portrait of Dr. Frank Lynch.**—A portrait of Dr. Frank W. Lynch, professor of obstetrics and gynecology, University of California Medical School, San Francisco, now hangs in the University Hospital, the gift of friends and students of Dr. Lynch. The gift commemorates his twenty-five years as professor in the medical school. The presentation was made by Dr. Ludwig A. Emge, clinical professor of obstetrics and gynecology at Stanford University School of Medicine, San Francisco, Dr. Lynch's first resident at California. Dr. Lynch was born in Cleveland on Nov. 5, 1871 and graduated at Johns Hopkins University School of Medicine, Baltimore, in 1899. He served on the staff of his alma mater from 1900 to 1904, at Rush Medical College, Chicago, 1905 to 1915, when he went to California. He was a member of the editorial boards of *Surgery, Gynecology and Obstetrics*, the *American Journal of Obstetrics and Gynecology* and the *Western Journal of Surgery*. He served as a member of the advisory board of the committee on prenatal and maternal care of the White House Conference and in 1936 was honor guest of the Pan-Pacific Surgical Congress. He was chairman of the Section on Obstetrics and Gynecology and Abdominal Surgery of the American Medical Association, 1923-1924.

### DISTRICT OF COLUMBIA

**Medical Society Election.**—Dr. Andrew Magruder MacDonald, coroner in the District, has been chosen president-elect of the Medical Society of the District of Columbia. He will take office in 1942. Dr. Henry R. Schreiber, now president-elect, will succeed Dr. Daniel L. Borden as president in July. Other newly elected officers include Drs. J. Lawn Thompson Jr. and Grace G. Pursa, vice presidents.

### ILLINOIS

**Courses in Obstetrics and Pediatrics.**—The University of Illinois College of Medicine, Chicago, announces a series of continuation study courses in obstetrics and pediatrics at Research and Educational Hospital, Chicago, in cooperation with the state department of public health, the state medical society and the approved medical schools of Chicago. The course of study will be repeated at weekly intervals June 16, 23, July 7, 14. Instructors representing Rush Medical College

will be Drs. Joseph L. Bacr and Arthur H. Parmelee; Illinois medical school, Drs. William H. Browne, Frederick H. Falls, Julius H. Hess, Bengt L. K. Hamilton, Alfred J. Kobak, Charles Newberger, Henry G. Poncher, Harry Leichenger; University of Chicago, The School of Medicine, Douglas N. Buchanan, Henry C. Hesseltine, William J. Dieckmann; Northwestern University Medical School, William C. Danforth, John A. Bigler, Stanley Gibson, and Loyola University School of Medicine, Dr. Herbert E. Schmitz. One lecture will be given each morning and the remainder of the day will be given over to informal conferences in the dispensaries at the Research Hospital, ward walks at both Cook County and Research hospitals, special demonstrations of technics, round table discussions, manikin work and other special activities.

### CHICAGO

**Courses in Obstetrics.**—The Illinois State Department of Public Health and the U. S. Children's Bureau are sponsoring ten four week courses in obstetrics during 1941-1942 at the Chicago Lying-in Hospital, University of Chicago, beginning June 30. Only a limited number of physicians will be accepted for each course. Members of the university staff will participate in the courses, which include lectures, clinics and birth room demonstrations. Application and inquiries should be addressed to Postgraduate Course, Department of Obstetrics and Gynecology, 5848 Drexel Avenue.

**New Appointments in Psychiatry at Illinois.**—Dr. Francis J. Gerty, clinical professor and chairman of the department of neurology and psychiatry, Loyola University School of Medicine, has been appointed professor and head of the department of psychiatry at the University of Illinois College of Medicine, filling the vacancy brought about by the death of Dr. Harold Douglas Singer last August. This appointment was effective June 1. Dr. Paul L. Schroeder, professor and head of the department of criminology, social hygiene and medical jurisprudence at the university, will become professor of psychiatry, September 1. Dr. Schroeder will also be in charge of child psychiatry and of the children's ward in the Neuropsychiatric Institute at the school. Dr. Gerty was born in Chicago in 1892, graduating at Loyola in 1921. He taught in the Chicago public schools from 1912 to 1916 and since 1922 has been superintendent of Cook County Psychopathic Hospital and county physician. He was associate professor of nervous and mental diseases at Loyola from 1926 to 1930, when he was named professor and head of the department. Born in Hoyleton, Ill., in 1894, Dr. Schroeder graduated at Illinois in 1919. He was neuropsychiatrist with the U. S. Veterans Bureau from 1921 to 1922; assistant managing officer and acting managing officer at the Lincoln State School and Colony, 1922-1924, and psychiatrist, division of criminology, state department of public welfare, 1924-1930. He has been state criminologist, director of the Institute for Juvenile Research and professor and head of the department of criminology at Illinois since 1931. In 1940 he was president of the American Orthopsychiatric Association.

### KANSAS

**Postgraduate Clinics.**—The University of Kansas School of Medicine, Lawrence-Kansas City, conducted its tenth annual postgraduate clinics, April 7-10. This year emphasis was placed on diagnostic and therapeutic procedures. The session concluded with a symposium on sulfonamide drugs, presented by Drs. Ralph H. Major, Leroy A. Calkins, Nelse F. Ockerblad, James B. Weaver, all of Kansas City, Mo., and Tom R. Hamilton, Kansas City.

**The Porter Lectures.**—Dr. Frederick A. Collier, professor of surgery, University of Michigan Medical School, Ann Arbor, delivered the eleventh course of lectures under the Porter Lectureship in Medicine of the University of Kansas School of Medicine, Lawrence-Kansas City, May 20-21. His subjects were "The Role of Fascia in the Spread of Infection," "The Historical Relation of Medicine and Surgery" and "Treatment of Wounds with Special Reference to Those Produced by War."

### KENTUCKY

**Personal.**—Dr. John Henry Rompf, clinical director of the Eastern State Hospital, Lexington, has been called to military service and Dr. Anthony E. Coletti, formerly of Norfolk, Neb., has succeeded him at the hospital.—Dr. Emil A. Steiner, Somerset, has resigned as health officer of Pulaski County.—Dr. Lee A. Dare, formerly of Lawrenceburg, has resigned as health officer of Anderson County, and Dr. Paul D. Moore, Calhoun, has resigned in McLean County.



# MEDICAL NEWS

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**Dr. Gary Heads State Association.**—Dr. William E. Gary, Hopkinsville, has been named president of the Kentucky State Medical Association to fill the unexpired term of the late Dr. Austin Bell, Hopkinsville. Dr. Bell died suddenly in Louisville, April 3. Dr. Gary will serve until the annual meeting of the association, September 29-October 2, when Dr. Elmer L. Henderson, Louisville, will become president.

**Society News.**—A symposium on military medicine was presented before the Jefferson County Medical Society, Louisville, May 19, by Lieut. Col. Claude D. Holmes, M. C., U. S. Army, Fort Knox, on "Surgical Problems of Army Service"; Lieut. Col. Alvin J. Bayley, M. C., U. S. Army, Fort Knox, "Prevention and Treatment of Acute Respiratory Disease at Fort Knox, Winter of 1940-1941"; Major William N. Lipscomb, Louisville, "Medical Phases of Selective Service," and Capt. Gus W. Neece, flight surgeon, Patterson Field, Fairfield, Ohio, "Aviation Medicine."—Drs. David Woolfolk Barrow and William T. Briggs, Lexington, addressed the Fayette County Medical Society in Lexington, April 8, on "Treatment of Peripheral Vascular Disease" and "Bladder Symptoms with Normal or Apparently Normal Urine in the Female" respectively.

## MASSACHUSETTS

**Dr. Beecher Made Professor.**—Dr. Henry K. Beecher, associate in anesthesiology at Harvard Medical School, Boston, has been appointed professor to fill the Dr. Henry Isiah Dorr Chair of Research and Teaching in Anesthesiology and Anesthesia at the school. Dr. Beecher graduated at Harvard in 1932.

**Course in Public Health Engineering.**—The department of biology and public health, Massachusetts Institute of Technology, Cambridge, announces a summer course in public health engineering, June 16-July 25. Subjects to be covered are civil and military sanitation, sanitary bacteriology, sanitary biology and sanitary chemistry. For further information write to Murray P. Horwood, Ph.D., Room 10-439, Massachusetts Institute of Technology, Cambridge.

**District Society Observes One Hundredth Anniversary.**—The Essex North District Medical Society celebrated its one hundredth anniversary in Lawrence, May 7. The program included an inspection of the city's hospitals and a visit to various textile plants. The annual dinner was addressed by Drs. Walter G. Phippen, Salem, president of the Massachusetts Medical Society, and Frank H. Lalley, Boston, President-Elect of the American Medical Association. Three dramatizations of important medical events that occurred within the past hundred years were presented by members of the society, under the direction of Dr. Benjamin Spector, professor of anatomy and medical history, Tufts College Medical School, Boston. Old photographs, instruments and manuscripts of historical significance pertinent to the hundred years' existence of the society were on display. A ladies' program was also held to commemorate the anniversary.

## MINNESOTA

**Duluth's First Citizen for 1940.**—Dr. William R. Bagley, who has been practicing medicine in Duluth for forty-three years, has been selected as the city's "first citizen" for 1940, it was announced at the city's "first citizen" dinner, March 29. Dr. Bagley was presented with an American Legion plaque emblematic of his membership in Duluth's "immortal body," and his picture will be placed in the Hall of Fame corridor in the city hall. This idea was conceived by the David Wisted post of the Legion in Duluth in 1925. The choice of Dr. Bagley for this honor was made by the presidents of the eighteen leading civic and community clubs and women's organizations for "his work last year in the Duluth, state and national Izaak Walton leagues (for high school students), for his service as a member of the board of directors of the Chamber of Commerce and for his community leadership as president of the Rotary Club." He graduated at the University of Michigan Medical School, Ann Arbor, in 1898.

## MISSOURI

**Society News.**—The St. Louis Medical Society was addressed, April 22, by Drs. John H. Hershey on "Lateral Approach to a Diverticulum of the Cervical Portion of the Esophagus" and Forest H. Staley, "Some Physicochemical Studies on a Case of Pancreatic Fistula Following Operation for Acute Hemorrhagic Pancreatitis." Dr. John H. Peck, Oakdale, Iowa, discussed "An Evaluation of the Modern Methods Used in the Diagnosis and Treatment of Pulmonary Tuberculosis" before the society, April 8.—Dr. James H. Dangle, Kansas City, presented "Arterial Hypertension—A Critical Review of Recent Progress in Classification, Etiology and Treatment" before the Jackson County Medical Society in Kansas City, April 22, and Dr. Frederick A. Jostes, St. Louis, showed a motion picture on "Backache."

**Gibbs Medal to Dr. Doisy.**—Edward A. Doisy, Ph.D., professor of biochemistry and director of the department, St. Louis University School of Medicine, St. Louis, received the 1941 Willard Gibbs Medal of the Chicago section of the American Chemical Society at a meeting in Chicago, May 23, in recognition of "conspicuous contributions to chemistry." The presentation was made by William Lloyd Evans, Ph.D., professor and chairman of the department of chemistry, Ohio State University, Columbus, president of the American Chemical Society, and Ernest H. Volwiler, Ph.D., of the Abbott Laboratories, North Chicago, Ill., described the scientific achievements of Dr. Doisy, who is credited with first isolating pure vitamin K. Born in Hume, Ill., in 1893, Dr. Doisy took his doctorate at Harvard University, Cambridge, Mass., in 1920. He was assistant in biochemistry at Harvard Medical School, Boston, from 1915 to 1917. He was instructor, associate and associate professor of biochemistry at Washington University School of Medicine, St. Louis, from 1919 to 1923, when he went to St. Louis University. He received the gold medal of the St. Louis University. He received the gold Conné Medal of the Chemists Club of New York in 1935 and the St. Louis Award in 1939. He has given special lectures throughout the country from time to time and has written numerous articles on his researches.

## NEW JERSEY

**Society News.**—Dr. Evan W. Thomas, New York, addressed the Bergen County Medical Society, Englewood, May 13, on "Modern Treatment of Syphilis."—At a meeting of the Morris County Medical Society at the Shongum Mountain Sanatorium, Morristown, May 15, the speakers were Drs. Samuel C. Haven, Morristown, and William K. Booth, Boonton, on early history and recent activities, respectively, of the sanatorium and Dr. Paul Geary, Plainfield, on "Surgical Treatment of Pulmonary Tuberculosis."—Speakers at the annual meeting of the Cape May County Medical Society, Ocean City, May 13, included Drs. Chester I. Ulmer, Gibbs-town, on "Are You Aiding the Public in Self Medication?" and Frederic J. Quigley, Union City, "Why a Legislative Committee?"

## NEW YORK

**Mental Hygiene Unit in County Health Department.**—Dr. George M. Lott of Amityville, L. I., has been appointed director of a new mental hygiene unit in the Suffolk County Department of Health, with headquarters in Riverhead. The county board of supervisors authorized an appropriation last October of \$17,000 to establish the service, and state aid will also be available, it was said. This is believed to be the first mental hygiene service organized under a county health department. It was supported by the medical profession and by many state and local health and civic agencies. In addition to Dr. Lott, the personnel will consist of a psychologist, two psychiatric social workers and a clerk. Dr. Lott graduated from the University of Colorado School of Medicine in 1928. He has served a fellowship in psychiatry at the Institute for Child Guidance in New York and for four years was director of the bureau of child guidance and state psychiatrist of Rhode Island. From 1936 to 1939 he was psychiatrist in the bureau of child guidance of the board of education of New York City and has recently been engaged in private practice.

## New York City

**Doctors' Concert.**—The Doctors' Orchestra Society of New York held its third annual concert at Town Hall, May 9, under the auspices of the Physicians' Wives League of Greater New York for the aid of their relief fund. Fritz Mahler conducted and Michel Piastro, concertmaster of the New York Philharmonic Symphony Orchestra, was the soloist.

**Hospital News.**—Dr. Abraham M. Rabiner, Brooklyn, has been appointed clinical director of the Jewish Sanitarium and Hospital for Chronic Diseases in conjunction with a program to further research in the field of incurable diseases.—Dr. John P. Peters, New Haven, Conn., addressed the Journal Club of Montefiore Hospital, March 17, on "Clinical Implications of the Newer Knowledge of Carbohydrate Metabolism." Dr. Maurice B. Visseher, Minneapolis, was the speaker, April 14, on "Experimental Analyses of the Action of Several Car-

diac Glucosides," and Dr. Samuel Soskin, Chicago, spoke, May 7, on "Newer Concepts of Diabetes."—Dr. John H. Travis, superintendent of Willard State Hospital, Willard, N. Y., has been appointed superintendent of Manhattan State Hospital on Ward's Island. Dr. John R. Knapp has recently been acting superintendent at Manhattan.—Roosevelt Hospital has organized a catastrophe unit to serve at major accidents. Two teams of thirteen physicians each and three teams of thirteen nurses each were to be selected for service, available at all hours. Establishment of the unit was financed by a trustee of the hospital.

### NORTH CAROLINA

**State Tuberculosis Meeting.**—The annual meeting of the North Carolina Tuberculosis Association was held in Greensboro, April 30, with Dr. Harry E. Kleinschmidt, director of health education of the National Tuberculosis Association, New York, as the guest speaker. Dr. Charles W. Armstrong, Salisbury, was elected president.

**Personal.**—Dr. Dudley W. Smith, Waynesville, has gone to England to serve with the American Hospital near London for six months, it is reported.—Dr. Will H. Lassiter Jr., Selma, has been appointed health officer of Johnston County to succeed Dr. James H. Bunn Jr., Smithfield, who resigned to enter military service.—Dr. Paul R. Macfadyen Jr., Concord, recently acting health officer of Cabarrus County, has been appointed in Richmond County to succeed Dr. Tidal Boyce Henry, Rockingham.

**Special Societies.**—Dr. Archibald A. Barron, Charlotte, was elected president of the North Carolina Neuropsychiatric Association at a meeting in Durham recently; Dr. Fonso B. Watkins, Morganton, vice president, and Dr. Robert Burke Suitt, Durham, secretary. Dr. Walter Freeman, Washington, D. C., was the guest speaker on "Indications, Procedures and Results in Prefrontal Lobotomies."—Dr. Brodie C. Nalle, Charlotte, was elected president of the North Carolina Obstetrical Society at a meeting at Mid-Pines in March.—Dr. James B. Whittington, Winston-Salem, was named president-elect of the North Carolina Hospital Association at a business meeting in Charlotte, April 23, and Mr. J. Lyman Melvin, Rocky Mount, became president.

### PENNSYLVANIA

**Hospital Addition.**—A new wing providing additional facilities especially for the diagnostic department was recently dedicated at George F. Geisinger Memorial Hospital, Danville. The third floor has operating rooms, offices and space for the urologic department; the second is given over entirely to the department of medicine with examining rooms and clinical laboratories among other facilities; the basement floor provides a central supply room, sterilizing room and solution preparation room. The architects were Stevens and Lee, Boston.

#### Philadelphia

**Jarecki Lecture.**—The seventh annual Edwin A. Jarecki Memorial Lecture was presented at the Jewish Hospital, May 1, by Dr. Frank H. Lahey, Boston, President-Elect of the American Medical Association. His subject was "Lesions of the Stomach, Duodenum and Jejunum."

**Strittmatter Award to Dr. Reeves—Da Costa Oration.**—The Philadelphia County Medical Society conferred the Dr. I. P. Strittmatter Award, a gold medal and scroll, on Dr. Rufus S. Reeves at a meeting, May 2. The award was given to Dr. Reeves in recognition of his work as chairman of the annual Postgraduate Institute sponsored during the past six years by the county society. Dr. Reeves was president of the county society in 1939 and is now chairman of its committee on nutrition and deficiency diseases. He graduated from the University of Pennsylvania School of Medicine in 1912. On the same evening Dr. George P. Müller, professor of surgery, Jefferson Medical College, delivered the annual Dr. John Chalmers Da Costa Oration on "Surgical Aspects of Cancer of the Stomach."

### UTAH

**State Medical Meeting in Salt Lake City.**—The forty-seventh annual meeting of the Utah State Medical Association will be held at Kingsbury Hall, University of Utah, Salt Lake City, June 12-14, under the presidency of Dr. Alfred C. Calhoun, Salt Lake City. Guest speakers will include:

Dr. James Barrett Brown, St. Louis, Management of Compound Facial Injuries; Surgical Lesions of the Face, Mouth and Neck.  
Dr. Alfred J. Cone, St. Louis, Ear, Nose and Throat Problems in Rheumatic, Diabetic and Nephritic Children.

Dr. Robert J. Crossen, St. Louis, Diagnosis, Prophylaxis and Treatment of Uterine Carcinoma; Functional Uterine Bleeding; Dysmenorrhea.

Dr. Everett D. Plass, Iowa City, Hyperemesis Gravidarum; Treatment of Puerperal Infections.

Dr. John M. Rector, San Francisco, Present Status of Immunization Procedures; the Acutely Ill Child.

Dr. Edward H. Ryncarson, Rochester, Minn., Hyperinsulinism; Endocrinology—A Critical Review.

Dr. Cyrus C. Sturgis, Ann Arbor, Mich., Treatment of the Anemias; The Hemorrhagic Diseases.

The guest speakers will also conduct clinics. "The Doctor's Place in National Defense" will be the theme of a symposium and round table discussion Thursday evening. A similar program will be held on industrial diseases Saturday afternoon with the following speakers: Donald E. Cummings, B.S., associate professor of medicine, University of Colorado School of Medicine, Denver, on "Chemical Hazards in Industry"; Mr. Homer L. Sampson, New York, "X-Ray Considerations in Chest Diagnosis," and Dr. Carl M. Peterson, Secretary, Council on Industrial Health, American Medical Association, Chicago, "Industrial Hygiene in National Defense." At the annual banquet Friday evening Dr. Russell G. Frazier, Brigham Canyon, medical officer for the U. S. Antarctic Expedition, will discuss his experiences in the Antarctic.

### VIRGINIA

**Postgraduate Course in Medicine.**—The University of Virginia Department of Medicine, University, is offering a course on recent advances in medicine, June 16-21. The registration limit is fifty. The first similar course was given last year. This year there will be clinics instead of ward rounds, according to the announcement. Final reservations must be made by June 10. Dr. Staige D. Blackford, Box 1174, University Post Office, Charlottesville, is chairman of the committee on postgraduate clinics.

**The McGuire Lectures.**—Dr. Alfred Blalock, professor of surgery, Vanderbilt University School of Medicine, Nashville, Tenn., delivered the McGuire Lectures at the Medical College of Virginia, Richmond, April 24-25. His subjects were "Pathogenesis of Shock" and "Prevention and Treatment of Shock." The annual postgraduate lectures were presented at the college, April 25, on the general topic of treatment of trauma and shock in wartime. Speakers on this program were:

Dr. Lennox R. Broster, London, England, Recent Developments in the Treatment of War Wounds.

Lieut. Col. David N. W. Grant, medical division, U. S. Army Air Corps, Occupational Fatigue as Manifested in Flying Personnel.

Dr. Henry K. U. Beecher, Boston, Clinical Aspects of Anesthesia and Shock.

Dr. Claude C. Coleman, Richmond, Penetrating Wounds of the Brain.

Dr. Harry J. Warthen Jr., Richmond, Gas Bacillus Infection.

### WISCONSIN

**Dr. Buerki Goes to University of Pennsylvania.**—Dr. Robin C. Buerki, medical superintendent of the State of Wisconsin General Hospital, Madison, has been appointed dean of the University of Pennsylvania Graduate School of Medicine to succeed George H. Meeker, Ph.D., who will retire October 1. In addition Dr. Buerki will be director of hospitals of the University of Pennsylvania, a newly created post in which he will have direction over the University Hospital, the Graduate Hospital and the Orthopedic Hospital, the university announces. Dr. Buerki, who graduated from the University of Pennsylvania School of Medicine in 1917, is also executive secretary to the dean of the University of Wisconsin Medical School and professor of hospital administration in the school. From 1938 to 1940 he was on leave from Wisconsin to direct a survey of graduate medical education for the Commission on Graduate Medical Education. Dr. Buerki has been president of the American Hospital Association and of the American College of Hospital Administrators. Dr. Meeker has been dean of the graduate school of medicine at Pennsylvania since it was opened in 1919 and has also served as manager of the Graduate Hospital, professor of chemistry in the school of medicine and professor of biochemistry in the graduate school. He received the degree of doctor of philosophy from Lafayette College, Easton, Pa., in 1893 and has received honorary doctorates in science from the University of Pennsylvania and Villanova College and in laws from Ursinus and Lafayette colleges.

GENERAL

**New Director of Scientific Research at Meat Institute.**—Henry R. Kraybill, Ph.D., professor and head of the department of agricultural chemistry, Purdue University, Lafayette, Ind., has been appointed director of the department of scientific research of the American Meat Institute, succeeding Winford Lee Lewis, Ph.D., who asked to be relieved because of ill health. Dr. Lewis, who has held the position since 1924, will be associated with the institute in an advisory capacity. Dr. Kraybill has been professor and head of the department at Purdue since 1926 and concurrently state chemist and seed commissioner.

**Meeting of Thoracic Surgeons.**—The American Association for Thoracic Surgery will hold its annual session in Toronto, Canada, June 9-11, under the presidency of Dr. Fraser B. Gurd, Montreal, whose official address will be on "Pulmonary Abscess." The program will consider the following topics, among others: surgical treatment of pulmonary tuberculosis with and without endobronchial involvement, carcinoma of the lung, carcinoma of the esophagus and pulmonary suppuration. The entire first day and evening will be devoted to the tuberculosis problem. At the annual dinner Tuesday evening Wing Commander George E. Hall, Weston, Ont., will speak on "Aviation Medicine."

**Private Flying Safety Record Improves.**—Airplanes in private use flew 991,842 miles per fatal accident, 1,168,367 per pilot fatality and 1,659,420 per passenger fatality in 1940, the Civil Aeronautics Administration reported. In 1936 they flew only 586,920 miles per fatal accident. In 1940 there were 231 fatal accidents in which 196 pilots, 138 passengers, 13 students and 9 ground crew or third parties, a total of 356, were killed. In the last six months of 1940 there were 30,000 students in training in the Civilian Pilot Training Program. They flew 96,000,000 miles during the year with a total of 31 fatalities, including both students and instructors, the report stated. This shows 3,160,000 miles flown per fatality, the highest figure ever established in private flying, it was said.

**Changes in Status of Licensure.**—The Illinois State Department of Registration and Education announces the following:

Dr. Charles E. Leary, Du Bois, license restored Oct. 9, 1940.  
The Massachusetts Board of Registration in Medicine recently reported the following:

Dr. Michael Litvich, Revere, license restored, March 13.  
Dr. Anthony P. Carogana, Chelsea, license restored.  
The New York State Board of Medical Examiners recently reported the following action:

Dr. Alice M. Heinrich, Chairman, New York, license revoked.  
Dr. Isaac Workman, Brooklyn, license revoked, February 21.  
The Virginia State Board of Medical Examiners recently reported the following action taken Dec. 4, 1940:

Dr. Robert S. Fitzgerald, Logan, W. Va., Virginia license restored.  
Dr. Ulysses S. McCoy, Petersburg, license restored.  
The Public Health Council of West Virginia recently reported the following action:

Dr. Elmer Groves Kesler, formerly of Williamsburg, license revoked Oct. 31, 1940, following conviction of a felony.  
Dr. John B. Rosier, Philippi, license restored, March 3.  
**American Neurological Association.**—The sixty-seventh annual meeting of the American Neurological Association will be held at the Ambassador Hotel, Atlantic City, June 9-11. Speakers will include:

Drs. Eldridge H. Campbell Jr., Nathan F. Fradkin, Basile Lipetz, Albany, N. Y., Myasthenia Gravis Treated by Removal of Thymic Tumor: Report of Two Cases.  
Drs. James C. White and Jost J. Michelsen, Boston, Treatment of Obstructive Hydrocephalus in Adults by Drainage of the Ventricular System.  
Drs. Andrew J. E. Akelaitis, Wilford A. Risteen and William P. Van Wageningen, Rochester, N. Y., and R. Yorke Herren, Portland, Ore., A Contribution to the Study of Dyspraxia and Apraxia Following Partial and Complete Section of the Corpus Callosum.  
Drs. Herman I. Wortis, Norman H. Joffe, Martin H. Stein and Ernest Heuding, New York, Clinical and Chemical Studies in Wernicke's Syndrome.  
Drs. Howard A. Howe and David Bodian, Baltimore, Relation of Fiber Pathways to Local Immunity in Experimental Poliomyelitis.  
Drs. James Lawrence Pool and Paul F. A. Hoefler, New York, Conduction of Cortical Impulses in Experimental Convulsive Seizures.  
Joseph L. Miller Jr., Maxwell M. Wintrobe, Cecil Mustard, Dr. William Horsley Gantt and W. J. Brogden, Ph.D., Cerebellar Conditioned Reflexes.  
The American Association of Neuropathologists will hold its meeting at the Ambassador Hotel on June 9.

**Bequests and Donations.**—The following bequests and donations have recently been announced:

New York Dispensary, Presbyterian Hospital, New York Eye and Ear Infirmary, Lincoln Hospital and Home, New York Hospital and New York Orthopaedic Dispensary and Hospital, each \$100,000 by the will of Miss Caroline White. All are in New York.  
Mount Sinai Hospital, New York, \$1,000 by the will of the late Mrs. Henrietta Hirschman; \$35,000 under the will of the late William N. Cohen.  
New York Post-Graduate Medical School and Hospital, \$25,000 from the will of the late Mrs. Florence Brevort Eickemeyer, Yonkers, N. Y.  
Abington Memorial Hospital, Abington, Pa., and the Philadelphia Health Council, \$1,000 each by the will of the late Mrs. George Horace Lorimer.  
Es'Dorn Hospital, Walterboro, S. C., \$1,000 from the estate of Frank L. Hutton, New York.  
New York Orthopaedic Dispensary and Hospital, \$100,000 and a contingent bequest of the residuary estate of Miss Josephine C. Smith, Philadelphia.  
Montefiore, Mount Sinai and Beth Israel hospitals, New York, \$106,863 each by the will of the late James Ulman.  
Lake County Memorial Hospital, Painesville, Ohio, \$5,000 by the will of Mrs. Alice Maury Parmelee.  
Deaconess Hospital, Spokane, Wash., property valued at \$233,362.50 from the estate of the late Dr. Theodore Dean Chamberlin, Concord, Mass., in memory of his brother, Frederick Dean Chamberlin, a Spokane pioneer.

**Vital Statistics for 1939.**—The death rate for the United States registration area in 1939 was 10.6, the lowest ever recorded, according to a final report issued by the U. S. Bureau of the Census. The birth rate declined from 17.6 per thousand of estimated population in 1938 to 17.3 in 1939. There were 2,265,588 births and 1,387,897 deaths reported for the year. Death rates for such causes as heart disease, cancer and diabetes were higher than ever, but those for influenza and pneumonia, for tuberculosis and the infant and maternal mortality rates were the lowest ever reported for the death registration area. Death rates for selected causes showed 43.2 per hundred thousand of population for tuberculosis, 59.4 for pneumonia and 16.4 for influenza. Cancer showed the highest rate for cancer of the digestive organs and peritoneum, 54.9; female genital organs 15.9, breast 11.4 and other forms 35.6. The rate for rheumatic diseases of the heart 20.1, diseases of coronary arteries and angina pectoris 68.5, other forms of heart disease 14.2, which was smaller than that for the preceding four years shown in the table. Motor vehicle accidents gave a rate of 24.8 and other accidents 46.1. A table analyzing causes of death in infants under 1 year of age gave the highest causes as premature birth, 32,251 out of a total of 103,846 infant deaths; pneumonia 13,786; congenital malformations 10,390; injury at birth 10,164; diarrhea, enteritis etc. 9,096; influenza transportation accidents, 30,468 occurred in automobile accidents; 1,329 in train and automobile accidents and 3,394 in other railway accidents; 1,087 in water transport and 396 in air transport.

CANADA

**Balfour Lectureship.**—Dr. David Cheever, associate professor of surgery emeritus, Harvard Medical School, Boston, was the speaker for the fiftieth annual Donald C. Balfour Lectureship in Surgery, April 5, at the University of Toronto Faculty of Medicine. His subject was "War—Its Tolls and Its Tributes."

**Canadian Medical Association.**—The seventy-second annual meeting of the Canadian Medical Association will be held at the Hotel Alexandra, Winnipeg, June 23-27, under the presidency of Dr. Duncan Graham, Toronto. Among speakers at general sessions will be:

Dr. William F. Braasch, Rochester, Minn., The Surgical Kidney as a Factor with Hypertension.  
Dr. Rustin McIntosh, New York, Jaundice.  
Drs. Ralph M. Tovell and Curtiss B. Hickcox, Hartford, Conn., The Present Status of Cyclopropane.  
Dr. Adam F. Menzies, Morden, Man., Postwar Medical Problems.  
Dr. Gordon E. Richards, Toronto, Ten Years' Progress in the Radiotherapy of Oral Cancer.

The section of military medicine will have a symposium on "Medical Aspects of Casualties Returning from Overseas," with the following speakers: Lieut.-Col. Andrew M. Davidson, Capt. Harry S. Atkinson, Lieut.-Col. Thomas E. Holland, Major Harry G. Grieve and Major Morley R. Elliott, all of the Royal Canadian Army Medical Corps; Wing Commander George E. Hall, Ottawa, Royal Canadian Air Force, and Drs. James D. Adamson and John A. Gunn, Winnipeg. A message from the association states that physicians of the United States will be welcome to this meeting, that no passports are required and that there are no financial or commercial restrictions. Other hotels in addition to the Alexandra are the Fort Garry, St. Charles, Marlborough, St. Regis and the Mall. There are hard surface, all weather roads leading to Winnipeg via Emerson or Kenora.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

March 22, 1941.

#### The Ophthalmic Quacks of London

An ophthalmic surgeon, Mr. E. W. Brewerton, has contributed to *St. Bartholomew's Hospital Journal* an account of the ophthalmic quacks who have flourished in London during the last twenty years. These quacks may be classified as (1) those who say that every chronic eye condition can be cured by glasses, (2) those who claim the same for other means, usually electricity, (3) those who claim to relieve every error of refraction by exercises and say that all glasses are unnecessary, (4) the osteopaths, who will guarantee a cure for everything from pruritus ani to detached retina by replacing a displaced vertebra and (5) the psychoanalysts. The first class orders patients suffering from errors of refraction, cataract, optic atrophy or macular degeneration to read for a certain number of hours daily with strong magnifying glasses. A man named Fournier, who was backed by a well known admiral, was the originator of this method. He claimed that his glasses were of secret manufacture. He flourished for many years until the business was taken over by Wright, who died after a few years lucrative practice, to be followed by his brother. The present proprietor of the business displays in his waiting room a printed notice that he cured a certain cabinet minister when London ophthalmologists failed.

The quacks who claim to cure by electricity flourish on the many who have a horror of operation on the eye. A man with advancing cataract was told to attend three times a week at a fee of \$30. One pole of a galvanic battery was applied to the neck and the other was passed round the orbit. At every visit the nurse told him he was better, but as his vision deteriorated the chair was put nearer to the type to make him believe that he was improving. At least six rooms used in the house were always full; the proprietor must have been making \$250,000 a year. The patient was told that his was a very difficult case and that another course was necessary. This he declined.

Those who treat presbyopia and errors of refraction by exercise and say that all glasses are unnecessary deny that accommodation depends on the ciliary muscle and attribute it to the extrinsic muscles of the globe. Their leader says that the more the eyes are used the stronger they get and that light, especially sunlight, is a cure for all kinds of defective sight. Mr. Brewerton mentions the case of a boy with 4 diopters of myopia who was promised a cure. After twelve months' treatment by exercises he could not see 6/60 and his error is now 4.5 diopters.

#### Marriage of Relatives

Since 1603 the Church of England has had "A Table of Kindred and Affinity, wherein whosoever are related are forbidden in Scripture and our Laws to marry together." This table was drawn up by Calvin but is ultimately derived from the Levitical code. It became the law of England in 1603 and remained so without modification for three hundred years. There are thirty prohibitions for each sex. Close relation by marriage was as much a ground of prohibition as consanguinity. Thus marriage with a deceased wife's sister was banned equally with marriage with a sister. Reform which began in 1907, made marriage with a deceased wife's sister legal. The whole subject was reconsidered recently when the archbishop of Canterbury appointed an ecclesiastical commission which has presented a report. Expert evidence was obtained on the scientific aspect.

Prof. J. B. S. Haldane, F.R.S., the geneticist, points out that the danger in consanguineous marriages is the production in the

offspring of diseases depending on recessive genes. Examples are furnished by albinism, porphyria, xeroderma pigmentosum, keratoma malignum, ichthyosis congenita, retinitis pigmentosa, amaurotic idiocy, deaf-mutism and congenital diplegia. In consanguineous marriages the probability of a recessive gene for these conditions being present in both parents is much greater than when the parents are not related. Thus albinism occurs with a frequency of one in forty thousand when the parents are not related, but one in eight hundred in incestuous brother and sister unions and in one in three thousand two hundred in first cousin unions. But Haldane says that an absolute line of prohibition cannot be drawn on biologic grounds. Two goods—freedom and health—must be balanced against each other. He would not recommend prohibition of the marriage of first cousins but does not regard its prohibition as unscientific. He recommends that all existing prohibitions based on consanguinity, such as uncle and niece, should be continued. But there is no valid scientific grounds for prohibiting such marriages as that of a man with his deceased wife's daughter, though the idea excites slight repugnance in him.

The principal recommendation of the commission is a revised "table" differing from the original one in omitting the prohibitions of marriage with sister-in-law, sister's son's wife and wife's niece. But some of these have already been abolished by Parliament. It will be seen that none of these marriages are consanguineous, so that all the original prohibitions of this nature stand.

### AUSTRALIA

(From Our Regular Correspondent)

Feb. 17, 1941.

#### Causes of Invalidism in Military Service

A clinical survey of the first group of invalid soldiers to be returned to Australia from abroad confirms the instructions already issued by the director general of medical services regarding the standards of physical fitness for recruits. All the patients carried on this voyage, and they include men from the New Zealand contingent as well as members of the Australian Imperial Force, have been boarded out as unfit for further service in the army abroad. Of 208 cases studied, 61 were due to diseases of or injury to the nervous system. Cases listed under the board heading "anxiety states" are subdivided into three groups: (1) anxiety states developed after enlistment without any previous history of "nerves" or "nervous breakdown," (2) anxiety states associated with a previous history of mental breakdown and (3) anxiety states with visceral fixation: (a) functional dyspepsia, (b) cardiac neurosis. Of all these cases twice as many occurred in the second as in any other group. Careful inquiry into the past histories of these patients showed that they were capable of "carrying on" in civil life in spite of minor breakdowns; but the strain of military life in active service quickly revealed their mental instability. A large number might have been excluded from the army if a truthful history had been given in the first place; failing this, however, there is no certain method whereby these potential invalids can be detected. Epilepsy, postconcussional headache and mental aberration accounted for the remainder of nervous disabilities. The postconcussional headache syndrome deserves consideration, for patients in this group could not stand any training at all. All had definite histories of severe head injuries, with periods of unconsciousness at the time of the accident, and in many instances scalp scars could be seen or irregularities felt in the bones of the skull. From a study of these and previous similar cases it is advised that no recruit with a history of severe concussion or head injury should be accepted for active service.

Diseases of the respiratory system (58) have been divided into nontuberculous (mostly asthma) and tuberculous. In view

of the 41 cases of asthmatic disability, it has been recommended that any soldier who has suffered from asthma, or a long-standing cough or in whom rhonchi can be detected in the lungs in the absence of a definitely acute infection, should be excluded. Of the 17 patients with pulmonary tuberculosis, 11 were recalled on account of lesions discovered in the roentgenograms prior to embarkation. In the other 6 cases there was no record in the available papers of the result of routine roentgen examinations, but in all cases the diagnostic films suggested a chronic lesion of more than a few months duration. This provides further proof of the usefulness of routine radiologic examination of the lungs on enlistment.

The high proportion of patients (42) suffering from peptic ulcer demands consideration. In 88 per cent of these invalids symptoms of dyspepsia had been present prior to enlistment, and 9 had undergone operations for ulcers. Only 5 patients were convinced that the symptoms had originated during active service. This suggests that active service conditions are more potent in precipitating a relapse than in producing the disease *de novo* and confirms the accepted view that patients with peptic ulcers should exercise lifelong care with regard to their diet and living conditions.

In view of these findings it has been recommended emphatically in Australia that subjects of nervous dyspepsia, hyperchlorhydria or severe gastric disturbances should not go abroad.

The incidence of painful back as a cause of invalidism is surprisingly high and suggests that a careful inquiry into the past history of back strain should be made prior to enlistment, particularly in men over 35 years of age.

The special attention paid to examination of the feet of recruits has avoided any large wastage because of foot disabilities, and only 8 were invalidated home on this account.

It is gratifying to note, and reflects praise on the army medical authorities, that the incidence of tropical diseases and of venereal infection are almost negligible.

A review of these 208 cases then reveals a low incidence of diseases with detectable physical signs. The larger groups consist of those conditions which cause symptoms rather than physical signs. The inference is that, although the physical examination of recruits has been of a high standard, sufficient emphasis has not been laid on a careful clinical history.

#### Conference on Public Health

At a conference convened by the director general of health in New Zealand, Dr. M. H. Watt, to consider public health problems with especial reference to war conditions, attention was drawn to the high proportion of recruits who on medical examination were rejected for foot trouble. A preliminary investigation into the suitability of the lasts used for making footwear in New Zealand, prompted by this observation, pointed to the fact that many of the lasts were unsatisfactory; and it has been decided to bring the matter to the notice of the Department of Industries and Commerce through the Royal Australian College of Surgeons. At the same conference it was pointed out that influenza, rubella and cerebrospinal meningitis were at the moment of only secondary importance and presented no special difficulties. Attention was drawn, however, to the absence of any reference to sinus infections in the medical examinations of recruits.

The question of mass radiography in tuberculosis control was discussed at length. The success of the routine chest roentgen examination of recruits had brought the matter into prominence in New Zealand, and steps had already been taken in Wellington to investigate the application of miniature radiography to the local civilian problem.

With regard to methods of quarantine and port health inspection, the conference resolved that full quarantine (by which is meant the detention in quarantine stations of passengers and companies of ships on which a case of quarantinable disease has occurred) is highly expensive, inefficient and

impracticable and should be abandoned in favor of the English system whereby infectious patients on arriving ships are sent to isolation hospitals while other persons on board are allowed to go about their business under the surveillance of the local medical officers of health.

It was reported that the incidence of gonorrhea and syphilis in military camps since the outbreak of war had been particularly small and that the introduction of facilities for preventive treatment had met with considerable success.

Dr. Muriel Bell, nutrition expert in the department of health, summarized the existing errors of diet in New Zealand. The average person probably (a) ate too much meat, sugar, cakes and confectionery and (b) ate too little fish, raw fruit, raw vegetables, milk, eggs, unrefined cereals and cheese. It was likely that in most homes there was a suboptimal intake of vitamin B<sub>1</sub> and that, as the majority of people were impervious to propaganda about whole meal bread, it was necessary to take steps to improve the vitamin content of white bread. This could be done either by adding synthetic vitamin B<sub>1</sub> to the bread or by increasing and improving the yeast used.

#### Hydatid Disease in New Zealand

A study of the recent data accumulated by Sir Louis Barnett, chairman of the New Zealand Hydatid Research Committee, on the incidence of hydatid disease in New Zealand reveals that about 120 new cases of the disease are treated in that country each year and that about 16 of them are fatal. About half the country's sheep and cattle have livers and lungs infected with hydatids, while a third or more of all country dogs harbor the adult parasite *Taenia echinococcus*. In spite of an intensive campaign of prevention there is no definite evidence yet that, taking New Zealand as a whole, hydatid infection is on the wane. The South Island, though only half as populous as the North Island, yet has almost as many cases of hydatid disease. This disproportion is largely due to a particularly heavy infection in the Canterbury district.

### Marriages

CHARLES GRANGER CHAPMAN, Columbia, S. C., to Miss Florence Radcliffe Clauss of Charleston, March 1.

ALFRED FRANKLIN HAMMOND JR., Pollocksville, N. C., to Miss Lucy Olivia Barrow of Grifton in March.

PHILLIP WEBSTER HORN, Ardmore, Okla., to Miss Ruth Elizabeth Johnson of New Orleans, March 17.

COURTLANDT DIXON BERRY, Rahway, N. J., to Miss Frances Woodward of Winter Park, Fla., February 15.

RALPH CARBONE, Fort Lee, N. J., to Miss Ruth Stearn of Grantwood, at Camp Livingston, La., recently.

JAMES BARRETT CUMMINS, Gloversville, N. Y., to Dr. Ella E. Foster of Glenside, Pa., March 15.

ROBERT LEON BOURLAND, Memphis, Tenn., to Miss Rosa Elizabeth Landess of Murray, Ky., March 5.

LEON TOLAND KENNEDY, Winston-Salem, N. C., to Miss Irene Storm in Mooresville, March 19.

ALEXANDER A. YORK, High Point, N. C., to Mrs. Mary E. Inman of Washington, D. C., March 2.

MARCUS WHITMAN HEDGCOCK, Champaign, Ill., to Miss Erna Bissell of Chicago, February 19.

GEORGE L. CARRINGTON, Burlington, N. C., to Miss Elizabeth Scott of Philadelphia, March 1.

WILLIAM J. LANCASTER, Wilmington, N. C., to Miss Jean Lunden of Tampa, Fla., in March.

ERASTUS GENAIR GOODMAN, Leland, N. C., to Miss Elizabeth Zuidema of Hampton, Va., in March.

WILLIAM L. KIRKPATRICK to Miss Ellie Thompson, both of Waynesville, N. C., recently.

CONNELL HUTCHINSON MILLER to Miss Nettie Stewart, both of Sligo, Pa., March 14.

ROBERT L. WADE to Miss Mabel Mains, both of Coldwater, Mich., in April.



## Deaths

**Allen Kramer Krause**, Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1907; assistant in pathology, 1907-1908, instructor in pathology, 1908-1909, associate professor of medicine and director of the Kenneth Dows Tuberculosis Research Laboratory from 1916 to 1929, visiting lecturer in medicine from 1930 to 1932 and lecturer in medicine in 1932 at his alma mater; fellow by courtesy in epidemiology, Johns Hopkins University School of Hygiene, from 1936 to 1939; in charge of the tuberculosis division of the Johns Hopkins Dispensary and associate physician, Johns Hopkins Hospital, from 1919 to 1929; director of the Desert Sanatorium, Tucson, Ariz., from 1929 to 1937; clinical professor of medicine, Stanford University School of Medicine, San Francisco, from 1929 to 1937; clinical professor of medicine at the University of Southern California School of Medicine, Los Angeles, from 1932 to 1937; member of the Association of American Physicians, American Society for Clinical Investigation, American Clinical and Climatological Association, American Association of Anatomists, American Association of Pathologists and Bacteriologists and the Society of American Bacteriologists; fellow of the American College of Physicians; for many years member of the medical council of the Veterans Administration; assistant and assistant director of the Saranac Laboratory for Study of Tuberculosis from 1906 to 1916; in 1931 was awarded the Trudeau Medal of the National Tuberculosis Association; author of "Environment and Resistance in Tuberculosis" and "The Evolution of Tubercle"; contributor to Nelson's Loose Leaf System of Medicine, Osler's Modern Medicine, Cecil's Textbook of Medicine, Piersol's Cyclopedia of Medicine and the Encyclopedia Britannica; formerly managing editor and editor of the *American Review of Tuberculosis*; for many years editor of the American section of *Tubercle*; aged 60; died, May 12.

**Matthias Nicoll Jr.**, Rye, N. Y.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1892; chairman of the Section on Preventive and Industrial Medicine and Public Health of the American Medical Association, 1925-1926; formerly clinical professor of infectious diseases, University and Bellevue Hospital Medical College, New York; chief of the division of diagnosis and assistant director of the New York City Department of Health from 1908 to 1914; secretary and director of public health education, New York State Department of Health from 1915 to 1917; deputy commissioner of health from 1917 to 1923; commissioner of health of New York from 1923 to 1930; commissioner of health of Westchester County from 1930 to 1938; past president of the State and Provincial Health Authorities of North America; member of the governing council and executive board of the New York Academy of Medicine; for many years attending physician to the Willard Parker Hospital, Seton Hospital and the New York Foundling Hospital, New York; aged 73; died, May 13.

**Henry Keller Mohler**, Philadelphia; Jefferson Medical College of Philadelphia, 1912; in charge of the laboratory of clinical medicine, 1913-1914, instructor in medicine from 1913 to 1922, demonstrator of medicine from 1922 to 1925, associate in medicine from 1925 to 1929, assistant professor from 1929 to 1932, associate professor from 1932 to 1938, clinical professor of therapeutics from 1936 to 1938 and since 1938 dean and Sutherland M. Prevost professor of therapeutics at his alma mater; medical director of the Jefferson Medical College Hospital from 1914 to 1938, assistant physician from 1932 to 1938, attending physician since 1938 and physician in charge of the department of electrocardiology; served during the World War; fellow of the American College of Physicians; charter fellow of the American College of Hospital Administrators; past president of the Hospital Association of Pennsylvania and of the Philadelphia Heart Association; director of the Philadelphia Health Council and Tuberculosis Association; member of the board of directors of the Children's Heart Hospital; member of the city board of health; aged 54; died, May 16, of cerebral hemorrhage.

**Dudley Almonte Smith**, San Francisco; Jefferson Medical College of Philadelphia, 1900; member of the House of Delegates from 1927 to 1930 and in 1932 and chairman of the Section on Gastro-Enterology and Proctology of the American Medical Association, 1930-1931; past president of the American Proctologic Society; fellow of the American College of Surgeons; clinical instructor in surgery at the University of California Medical School; aged 70; on the staffs of the Uni-

versity of California Hospital, St. Luke's Hospital, Southern Pacific General Hospital and Mary's Help Hospital, San Francisco; Alta Bates Hospital, Berkeley; Providence Hospital and Peralta Hospital, Oakland, where he died, April 24.

**Forrest Mullins Barfield**, Atlanta, Ga.; Atlanta Medical College, 1915; member of the Southeastern Surgical Congress; fellow of the American College of Surgeons; served during the World War; instructor in surgery at the Emory University School of Medicine, from 1919 to 1930; associate visiting surgeon, Emory University Hospital; associate visiting gynecologist and obstetrician, Georgia Baptist Hospital; associate surgeon, Crawford W. Long Memorial and Piedmont hospitals; aged 49; died, April 17, of heart disease.

**Paul Dee Berrisford**, St. Paul; University of Minnesota College of Medicine and Surgery, Minneapolis, 1912; member of the Minnesota State Medical Association and of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; clinical assistant professor of ophthalmology at his alma mater, now the University of Minnesota Medical School; on the staffs of the Children's, St. Luke's and Charles T. Miller hospitals; aged 55; died, April 17, of cerebral hemorrhage.

**John Charles McCoy**, Paterson, N. J.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1892; fellow of the American College of Surgeons; served during the World War; consulting surgeon, Paterson General Hospital, Dover (N. J.) General Hospital, Holy Name Hospital, Teaneck and the Good Samaritan Hospital, Suffern, N. Y.; aged 74; died, April 17, in the Harkness Pavilion, Columbia Presbyterian Medical Center, New York, of intestinal obstruction.

**Charles Herbert Holt**, Pawtucket, R. I.; Harvard Medical School, Boston, 1906; past president and vice president of the Rhode Island Medical Society; member of the New England Surgical Society; fellow of the American College of Surgeons; served during the World War; formerly mayor of Pawtucket; at one time city health officer; served on the staff of the Memorial Hospital in various capacities; aged 60; died, April 26, in the Quincy (Mass.) Hospital of cerebral hemorrhage.

**Robert Bernard Gaston**, Lebanon, Tenn.; Vanderbilt University School of Medicine, Nashville, 1912; member of the Tennessee State Medical Association; fellow of the American College of Surgeons; secretary of the Wilson County Medical Society; past president of the Middle Tennessee Medical Association; formerly owner and medical superintendent of the Martha Gaston Hospital; aged 53; died, April 16, at the Vanderbilt Hospital, Nashville.

**Arthur Rufus Trego Wylie**, Faribault, Minn.; University of Minnesota College of Medicine and Surgery, Minneapolis, 1906; member of the American Psychiatric Association; at one time superintendent of the North Dakota State Institution for the Feeble-minded, Grafton, N. D.; on the staff of the Minnesota School for Feeble-minded; aged 69; died, March 30, of glomerular nephritis, uremia and coronary thrombosis.

**Jacob Paul Frantz**, Clearfield, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1910; member of the American College of Chest Physicians; secretary of the Clearfield County Medical Society; for many years president of the city board of health; president of the Clearfield County Tuberculosis Society; on the staff of the Clearfield Hospital; aged 55; died, April 8, of nephritis.

**Jacob Allen Stout**, Bexley, Ohio; Starling Medical College, Columbus, 1889; member of the Ohio State Medical Association; formerly examining physician for the county court of domestic relations; for many years on the staff of St. Anthony Hospital and St. Ann's Infant Asylum and Maternity Hospital, Columbus; aged 78; died, March 30, of coronary embolism.

**James William Robinson**, Pittsburgh; University of Pennsylvania Department of Medicine, Philadelphia, 1907; associate professor of surgery, University of Pittsburgh School of Medicine; served during the World War; aged 56; on the staffs of the Rosalia Foundling and Maternity Hospital and the Mercy Hospital, where he died, March 23, of disease of the coronary artery.

**Charles W. Holland**, Scottsville, Ky.; University of Tennessee Medical Department, Nashville, 1896; member of the Kentucky State Medical Association; past president of the Allen County Medical Society; for many years health officer of Allen County; formerly member of the board of education; bank president; aged 68; died, April 24, of coronary occlusion.



**George William Conrad**, Johnstown, Pa.; Eclectic Medical Institute, Cincinnati, 1905; member of the Medical Society of the State of Pennsylvania; served during the World War; formerly chief medical examiner for the United States Pension Service; aged 61; died, April 6, in the Memorial Hospital of hypertension, uremia and nephrosclerosis.

**Judson Frederick Browne**, Rochester, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1907; member of the Medical Society of the State of New York; served during the World War; aged 59; died, April 5, in the Veterans Administration Facility, Batavia, of cerebral thrombosis following suprapubic prostatectomy.

**Joseph Spangenthal** @ Buffalo; University of Louisville (Ky.) Medical Department, 1892; University of Buffalo School of Medicine, 1896; at one time associate professor of dermatology at the University of Buffalo School of Medicine; aged 71; died, March 30, of hypostatic pneumonia, arteriosclerosis and diabetes mellitus.

**Walter McDonald Davidson**, Port Angeles, Wash.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1923; member of the Washington State Medical Association; aged 47; died, March 25, in a hospital at Seattle of duodenal ulcer, abscess of the neck with staphylococci septicemia and cirrhosis of the liver.

**Edward West Hollingsworth** @ Chicago; University of Virginia Department of Medicine, Charlottesville, 1918; member of the Central Society for Clinical Research; fellow of the American College of Physicians; on the staff of the Veterans Administration Facility, Hines; aged 47; died, March 15, of coronary thrombosis.

**Frank Ferrell**, Ashland, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1898; member of the Mississippi State Medical Association; president of the North Mississippi Medical Society; county health officer; aged 71; died, March 31, in Oxford, of glandular carcinoma of the cecum.

**Carr Thomas Dowell Jr.**, Baton Rouge, La.; University of Oklahoma School of Medicine, Oklahoma City, 1929; member of the Louisiana State Medical Society; first lieutenant in the medical reserve corps of the United States Army; aged 35; died, March 25, of acute dilatation of the heart.

**Thomas Jennings**, Clinton, Tenn.; University of Tennessee Medical Department, Nashville, 1909; member of the Tennessee State Medical Association; served during the World War; aged 57; died, March 31, in St. Mary's Hospital, Knoxville, of injuries received in an automobile accident.

**Daniel Crosby Greene** @ Newton, Mass.; Harvard Medical School, Boston, 1899; member of the American Laryngological, Rhinological and Otolological Society; fellow of the American College of Surgeons; at one time instructor in laryngology at his alma mater; aged 68; died, April 4.

**Valentine Ruch**, Englewood, N. J.; Cornell University Medical College, New York, 1903; member of the Medical Society of New Jersey; on the staffs of the Englewood Hospital, and the Holy Name Hospital, Teaneck; aged 65; died, March 30, of coronary occlusion.

**Alexander L. Johnson**, Gloversville, N. Y.; Albany Medical College, 1885; member of the Medical Society of the State of New York; on the staff of the Nathan Littauer Hospital; aged 79; died, February 27, of carcinoma of the larynx and acute dilatation of the heart.

**Edwin Nelson Cleaves**, Boston; Harvard Medical School, Boston, 1915; member of the Massachusetts Medical Society, American Roentgen Ray Society, New England Roentgen Ray Society and the American College of Radiology; aged 50; died, February 23.

**James P. Widmeyer** @ Rolla, N. D.; College of Physicians and Surgeons of Chicago, 1896; formerly mayor; chairman of the county board of health; at one time superintendent of the State Tuberculosis Sanatorium, San Haven; aged 72; died, March 17.

**Crayton C. Fargason**, Dadeville, Ala.; Atlanta (Ga.) College of Physicians and Surgeons, 1904; member of the Medical Association of the State of Alabama; county health officer; aged 66; died, March 30, in the Community Hospital, East Tallahassee.

**Joseph Bakst** @ New York; Columbia University College of Physicians and Surgeons, New York, 1906; on the staff of the Jewish Maternity Hospital; aged 72; died, April 13, in the Beth Israel Hospital, of arteriosclerosis, heart disease and pneumonia.

**Austin E. Miller**, McAllen, Texas; College of Physicians and Surgeons of Chicago, 1895; member of the Colorado State Medical Society; aged 75; died, February 21, in the McAllen Municipal Hospital of ruptured aneurysm of abdominal aorta.

**William Anderson Royer**, Battle Creek, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1892; member of the Michigan State Medical Society; aged 76; died, March 30, of cerebral thrombosis.

**Edgar Francis Smith**, Storm Lake, Iowa; State University of Iowa College of Medicine, Iowa City, 1908; member of the Iowa State Medical Society; formerly health officer; aged 67; died, March 8, of acute myocarditis.

**Herbert Carl Goetz**, Buffalo, University of Buffalo School of Medicine, 1919; member of the Medical Society of the State of New York; on the staff of the Deaconess Hospital; aged 46; died, April 8, of coronary occlusion.

**Herbert Livingston Scales** @ Hutchinson, Kan.; Louisville (Ky.) Medical College, 1892; member of the American Academy of Ophthalmology and Otolaryngology; aged 71; died, March 28, of cerebral hemorrhage.

**Edward Patrick D. Donohue**, Syracuse, N. Y.; Syracuse University College of Medicine, 1916; on the staff of St. Joseph's Hospital; aged 55; died, March 26, of arteriosclerosis, heart disease and diabetes mellitus.

**William Watson Ayres**, Washington, D. C.; Columbian University Medical Department, Washington, 1890; aged 73; died, February 10, in the Emergency Hospital of coronary thrombosis and lobar pneumonia.

**Harold E. Pratt**, San Pedro, Calif.; College of Medical Evangelists, Los Angeles, 1939; first lieutenant in the medical reserve corps of the United States Army; aged 31; was killed, April 3, in an airplane accident.

**Ernest Lazarus Booth**, East Boston, Mass.; Harvard Medical School, Boston, 1908; member of the Massachusetts Medical Society; for many years school physician; aged 56; died, March 24, of pneumonia.

**Maxwell Nathaniel Frank** @ Detroit; Detroit College of Medicine and Surgery, 1917; aged 47; died, April 1, in Miami Beach, Fla., of injuries received in an automobile accident several months previously.

**Richard R. Elmore** @ Louisville, Ky.; Hahnemann Medical College and Hospital, Chicago, 1903; University of Louisville Medical Department, 1904; aged 63; died, March 28, of a self-inflicted bullet wound.

**Frank Glynn Young**, Brooklyn; New York Homeopathic Medical College and Hospital, New York, 1906; aged 59; died, March 25, in the Veterans Administration Facility, Northport, of coronary occlusion.

**Lawrence Stevens** @ Billings, Mont.; University Medical College of Kansas City, Mo., 1910; served during the World War; aged 59; died, March 23, in San Diego, Calif., of coronary heart disease.

**William Clemens Davis**, Smithland, Ky.; Hospital College of Medicine, Louisville, 1902; member of the Kentucky State Medical Association; aged 69; died, March 30, of cerebral hemorrhage.

**William J. L. Roberts**, Chapel Hill, Texas; University of Texas School of Medicine, Galveston, 1904; member of the State Medical Association of Texas; aged 63; died, February 7, of heart disease.

**Oren Brown Richards Jr.** @ Moosie, Pa.; University of Rochester (N. Y.) School of Medicine and Dentistry, 1935; aged 29; died suddenly, March 31, of accidental carbon monoxide poisoning.

**Lester Edwin Hackbarth** @ Toledo, Ohio; State University of Iowa College of Medicine, Iowa City, 1927; on the staff of the Toledo Hospital; aged 42; died, March 31, in an automobile accident.

**William E. Catterson**, Noblesville, Ind.; Physio-Medical College of Indiana, Indianapolis, 1906; member of the Indiana State Medical Association; aged 78; died, April 6, of Parkinson's disease.

**Edward Barton Jones**, McLean, Va.; Columbian University Medical Department, Washington, D. C., 1902; served during the World War; aged 74; died, March 8, of coronary thrombosis.

**Gustave Lewis**, Seattle; University of Bishop College Faculty of Medicine, Montreal, Que., Canada, 1895; member of the Washington State Medical Association; aged 67; died, March 3.

**Russell Stewart Bacon** @ Montevideo, Minn.; Rush Medical College, Chicago; 1885; an Affiliate Fellow of the American Medical Association; aged 81; died, March 30, of cirrhosis of the liver.

**Edward Malcom Hoyt**, Georgetown, Mass.; Harvard Medical School, Boston, 1894; member of the Massachusetts Medical Society; aged 83; died, March 28, of coronary heart disease.

**William Victor Watson**, Redondo Beach, Calif.; Columbus (Ohio) Medical College, 1891; member of the Colorado State Medical Society; aged 77; died, March 27, of cerebral hemorrhage.

**John Knotz**, Cologne, Minn.; Minneapolis College of Physicians and Surgeons, Minneapolis, 1897; aged 68; died, March 31, of cerebral hemorrhage, arteriosclerosis and diabetes mellitus.

**William J. Robinson**, Portia, Ark.; Memphis (Tenn.) Hospital Medical College, 1897; member of the Arkansas Medical Society; aged 76; died, March 11, of chronic nephritis.

**Marie Meirovna Kovner Ramme**, Washington, D. C.; Second Moscow Medical Institute, Moscow, Russia, R. S. F. S. R., 1921; aged 46; died, March 12, of cerebral hemorrhage.

**D. J. Dunkelmann**, Clarence, La.; Hospital College of Medicine, Louisville, Ky., 1907; member of the Louisiana State Medical Society; aged 58; died, February 15, of hypertension.

**Julian N. Mincey** @ Mineral Wells, Texas; University of Texas School of Medicine, Galveston, 1899; aged 72; died, March 24, in the Nazareth Hospital of cerebral embolism.

**Charles A. Barlow**, St. Petersburg, Fla.; Baltimore Medical College; 1896; aged 66; died, April 11, in the Veterans Administration Facility, Bay Pines, of coronary occlusion.

**Walter Noble**, Aransas Pass, Texas; Tulane University School of Medicine, New Orleans, 1904; member of the State Medical Association of Texas; aged 64; died, March 27.

**Edgar Ardis Peterson**, Baltimore; Vanderbilt University School of Medicine, Nashville, Tenn., 1902; aged 59; died, March 29, of burns received when his home caught fire.

**Hugh Peavler**, Mount Vernon, Ill.; University of Tennessee Medical Department, Nashville, 1885; aged 76; died, March 29, of valvular heart disease and arteriosclerosis.

**Abram C. Cluts**, Prairie City, Ill.; Rush Medical College, Chicago, 1893; aged 73; died, March 31, in the Graham Hospital, Canton, of uremia and hypertrophy of the prostate.

**Robert T. S. Steele**, Williamsport, Pa.; University of Maryland School of Medicine, Baltimore, 1899; aged 67; died, March 5, in Fort Pierce, Fla., of cerebral hemorrhage.

**Thomas Francis Godfrey**, Springfield, Mass.; College of Physicians and Surgeons, Baltimore, 1898; aged 68; died, April 2, in the Mercy Hospital of chronic pyelonephritis.

**Thomas M. Merritt**, Americus, Ga.; College of Physicians and Surgeons, Baltimore, 1891; aged 77; died, March 30, of edema of the lungs and fracture of the left hip.

**William Moore**, New York; College of Physicians and Surgeons, medical department of Columbia College, New York, 1884; aged 79; died, March 20, of pneumonia.

**George Washington Mixon**, Watson, La.; Memphis (Tenn.) Hospital Medical College, 1894; parish health officer; aged 77; died, March 23, of gastric carcinoma.

**Elizabeth Bailey Muneey**, Washington, D. C.; Howard University College of Medicine, Washington, 1898; aged 83; died, March 9, of illuminating gas poisoning.

**Arthur John Ochs**, Oak Park, Ill.; Chicago College of Medicine and Surgery, 1915; member of the Illinois State Medical Society; aged 55; died, March 29.

**George L. Wimberley Jr.**, Rocky Mount, N. C.; University of Maryland School of Medicine, Baltimore, 1883; aged 79; died, March 22, of cerebral hemorrhage.

**Paul Jones Flory** @ Pawnee City, Neb.; University of Nebraska College of Medicine, Omaha, 1916; aged 51; died, March 4, of carbon monoxide poisoning.

**William N. Gray**, Celina, Tenn.; University of Tennessee Medical Department, Nashville, 1889; aged 81; died, March 31, in Nashville of cerebral hemorrhage.

**Hubert B. Strong**, Tyre, N. Y.; Detroit College of Medicine, 1892; aged 75; died, February 9, of diabetes mellitus, cerebral embolism and arteriosclerosis.

**William E. Busby**, San Diego, Calif.; National Medical University, Chicago, 1906; also a dentist; aged 74; died, February 12, of cerebral hemorrhage.

**Franklin Filmore Marsh**, De Land, Fla.; Hahnemann Medical College of Philadelphia, 1880; aged 88; died, March 20, of pneumonia, following influenza.

**Rufus C. McGahey**, Miami, Fla.; Vanderbilt University School of Medicine, Nashville, Tenn., 1878; aged 83; died, March 9, of bronchopneumonia.

**John Thomas Maloney**, Tuba City, Ariz.; Long-Island College Hospital, Brooklyn, 1928; member of the Indian Service; aged 39; died, March 5.

**George F. Kelly**, Los Angeles; Columbian Medical College, Kansas City, Mo., 1901; also a dentist; aged 73; died, February 20, of heart disease.

**Benjamin Hardy Carlton**, Freeport, Texas; University of Tennessee Medical Department, Nashville, 1888; aged 79; died, February 7, of influenza.

**Gedeon Des Rosiers**, St. Felix de Valois, Que., Canada; Victoria University Medical Department, Coburg, Ont., 1873; aged 93; died, February 15.

**Isaac N. Barnett**, Kansas City, Mo.; Washington University School of Medicine, St. Louis, 1897; aged 68; died, April 4, of cerebral hemorrhage.

**George W. Brown**, Lawtey, Fla.; University of Maryland School of Medicine, Baltimore, 1889; aged 74; died, April 2, of coronary occlusion.

**John W. Fawcett**, McKeesport, Pa.; Jefferson Medical College of Philadelphia, 1877; aged 87; died, March 2, of cerebral hemorrhage.

**Morris Rosentover**, New York; Bellevue Hospital Medical College, New York, 1897; aged 67; died, March 30, of carcinoma of the liver.

**Alice Winans Downey**, Washington, D. C.; George Washington University School of Medicine, Washington, 1911; aged 77; died, March 9.

**John W. Robertson**, San Francisco, Calif.; University of California Medical Department, San Francisco, 1880; aged 84; died, February 28.

**Theodore Alexandre Talbot**, St. Felicien, Que., Canada; Laval University Faculty of Medicine, Quebec, 1874; aged 82; died, February 12.

**Sandford Barto Henton**, Decatur, Miss.; Medical College of Alabama, Mobile, 1887; aged 79; died, March 31, of nephritis and heart disease.

**Hugh McLean Scott**, Morriston, Ont., Canada; Queen's University Faculty of Medicine, Kingston, 1929; aged 36; died in February.

**Joseph Ludger Gagnon**, Montmagny, Que., Canada; Laval University Faculty of Medicine, Quebec, 1912; aged 54; died, February 10.

**Cyrillus Wirth**, Davenport, Iowa; College of Physicians and Surgeons, Keokuk, 1893; aged 71; died, March 19, of heart disease.

**Louis Auguste Bourbeau**, Rouyn, Que., Canada; Laval University Faculty of Medicine, Quebec, 1928; aged 39; died, February 6.

**John McGovern**, Wisconsin Dells, Wis.; Northwestern University Medical School, Chicago, 1906; aged 69; died, March 13.

**Maria F. Spiess Schaltenbrandt**, San Francisco; California Medical College, San Francisco, 1895; aged 81; died, February 26.

**Nelson J. Shook**, Corunna, Ind.; Miami Medical College, Cincinnati, 1890; aged 80; died, March 31, of cerebral hemorrhage.

**Irving Muscanto**, Brookline, Mass.; Tufts College Medical School, Boston, 1934; aged 33; hanged himself, February 12.

**Joseph J. Nimshik**, Chicago; Chicago College of Medicine and Surgery, 1914; aged 66; died, February 21.

**Frank E. Keep**, Los Angeles; Cleveland Medical College, 1897; aged 66; died, February 5, of fractured pelvis.

**Albert Henry Lilley**, Long Beach, Calif.; Harvard Medical School, Boston, 1902; aged 62; died, February 14.

**Takejiro Itow**, Los Angeles; Keio Gijuku University Medical College, Tokyo, Japan, 1897; died, March 2.

**Hubert Joseph Williams**, Boston; Tufts College Medical School, Boston, 1901; aged 61; died, March 29.

**Charles Pollack**, Brooklyn; College of Physicians and Surgeons, Boston, 1906; died, March 21.

**Robert S. Foster**, Carolan, Ark. (licensed in Arkansas in 1903); aged 72; died, March 9.

## Bureau of Investigation

### CEASE AND DESIST ORDERS

#### Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicines or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission, by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable.

Abstracts of some of the orders issued during 1940 follow:

**Air Conditioning Soap.**—This product, also designated as "Air Conditioning the Human Body" soap, is or was put out by Air Conditioning Textiles, Inc., New York. On Aug. 23, 1940, the Federal Trade Commission ordered this concern to cease and desist from using the words "air conditioning" or any other similar term to describe its soap or from otherwise representing that this soap possesses air conditioning properties, that it reduces body temperature or humidity or eliminates perspiratory conditions or that the human body breathes through the pores of the skin.

**Ardanol, Chloro-Zol and Germ-I-Tabs.**—These are products of the American Drug and Chemical Company, Minneapolis. On Sept. 26, 1940, this concern was ordered by the Federal Trade Commission to cease and desist from making certain misrepresentations in its advertising. Among these were that "Ardanol," promoted for use in cases of vitamin E deficiency, is a cure or remedy for sterility or will restore or beneficially affect fertility or possesses any value as a preventive of abortion; that the preparations "Chloro-Zol" and "Germ-I-Tabs" constitute competent or effective antiseptics or germicides or a reliable or effective means of feminine hygiene, and that Chloro-Zol constitutes a competent or effective treatment for brownidrosis, tetter, itching and irritations of the skin, blisters on the feet, acne, boils, halitosis or body odors. The Commission's findings were that the respondent's products do not generally accomplish the results claimed and that, while Chloro-Zol and Germ-I-Tabs possess antiseptic properties of a low toxicity, they are not competent or effective antiseptics or germicides.

**Brewster Nostrums.**—Jefferson R. Brewster of Nashville, Tenn., has at different times run afoul of three government agencies—the Food and Drug Administration, the Federal Trade Commission and the Post Office Department. The last named has on three occasions issued fraud orders against Brewster and his trade names, debarring them from the use of the mails. The Food and Drug Administration once prosecuted him for making fraudulent claims on his labels, but unfortunately a jury in a district federal court brought in a verdict of not guilty. In 1938 the Federal Trade Commission commenced action against the Brewster outfit (then at Dallas, Texas) because of the false claims made for the Brewster nostrums as alleged remedies for cancer, asthma, tuberculous hemorrhages, pneumonia, diphtheria, gallstones, goiter and some other things. All these actions were discussed in THE JOURNAL, July 13, 1940, page 149. On July 16, 1940, the Federal Trade Commission reported that it had definitely ordered Jefferson R. Brewster, trading as Brewster Laboratories, and "Dr." Reece Brewster, Nashville, to cease making certain misrepresentations in the sale of his products sold under the Brewster brand, such as the "Tonic," "C-D," "T-Z," "Throat Wash," "Throat-Eaz," "Sinine," "Pain Kill," "Ready Relief" and "Pile Ointment." Among the misrepresentations were that these nostrums variously possess therapeutic value in the treatment of such conditions as tuberculosis, constipation, hemorrhages, nervousness, sinus and mastoid disorders, rheumatism, typhoid, cancer, gallstones, goiter and scintia. Brewster also was ordered to cease using the word "Laboratories" in his trade name.

**Dr. Pierre's Boro-Pheno-Form Vaginal Suppositories.**—This product and "Dr. Pierre's Boro-Pheno-Form Vaginal Creme" are put out by the Dr. Pierre Chemical Company of Chicago, which represented them as effective germicides and preventives of conception and as possessing substantial therapeutic agents which heal irritated tissues and membranes. On Oct. 5, 1940, the Federal Trade Commission ordered this concern to discontinue these practices and to cease representing that any substantial number of reputable physicians has approved or recommended the products.

**Glanlex.**—Advertising this product as a cure or a safe and effective treatment for prostatitis, cystitis, urethritis, sugar diabetes, dropsy, gastritis, malaria, ptomaine poisoning, rheumatism and some other things, George G. Neff, trading as the Prostex Company, Miami, Okla., was ordered by the Federal Trade Commission on July 22, 1940, to discontinue such misrepresentations and also to cease promoting the preparation as having any therapeutic value in excess of its laxative properties.

**Grove Laboratories, Inc.**—This St. Louis concern was ordered by the Federal Trade Commission on July 13, 1940, to cease representing that its "Pazo Ointment" is a cure or remedy for hemorrhoids or has any value in treating them aside from affording palliative relief in cases of simple hemorrhoids. The company was further ordered to discontinue representing that "Dr. Porter's Antiseptic Healing Oil" is an effective or standard treatment for cutaneous diseases caused by infection; that it is a competent agent in the treatment of dandruff, falling hair or diseases peculiar to the scalp; that it will promote the growth of hair, prevent baldness or destroy parasites usually associated with dandruff and other diseases of the scalp.

**Harmless Prescription Capsules.**—These bore the firm name of Snn Cut Rate Store, Huntington, W. Va., a trade style for Howard Deckelbaum, who also sold them under the names "Special Prescription Capsules" and "Prescription Female Capsules." The latter was designated as "double strength" or "triple strength." On Oct. 25, 1940, the Federal Trade Commission ordered Deckelbaum to discontinue advertisements representing that his preparation is a competent or effective treatment for delayed menstruation and that it is safe or harmless; or advertisements which fail to reveal that use of the preparation may cause gastrointestinal disturbances and excessive congestion and hemorrhage of the pelvic organs, and, in the case of pregnancy, may cause uterine infection and blood poisoning.

**Hot Springs Mineral Soap.**—This was one of the products put out by Lawrence L. Keller of Seattle, who did business as the United Soap Company. On July 18, 1940, the Federal Trade Commission ordered him to cease representing that soaps he sells under the brand names "Hot Springs Mineral Soap," "Hawaiian Rose," "Velvette" and some similar designations, are imported or are manufactured in any other place than Seattle, that they are "vitaminized" or medicated in any way, or have medicinal or curative value or are in any manner more beneficial than any ordinary toilet soap.

**Hydrosal Products.**—The Hydrosal Company of Cincinnati puts out "Hydrosal Liquid" and "Hydrosal Ointment." On June 3, 1940, the Federal Trade Commission ordered the company to cease representing in its advertisements that these nostrums possess curative or healing properties in the treatment of eczema, piles, athlete's foot, poison ivy or disorders characterized by or associated with pimples, cutaneous outbreaks or itches. The order also prohibited, among other things, the representation that the products named are in general use by the medical profession or hospitals.

**O. B. C. Capsules.**—This nostrum, also known as "O. B. C. Reducing Capsules," is put out by I. Ralph Weinstock, trading as Thyrole Products Company, Philadelphia. On Nov. 26, 1940, the Federal Trade Commission ordered this concern to cease representing that the product is a cure, remedy or a competent, safe or effective treatment for obesity. The order also prohibits the dissemination of advertisements failing to reveal that use of the preparation may cause permanent injury to the heart, thyroid gland and other vital organs. The Commission declared that the nostrum will not accomplish the results claimed and is not safe to use, because the stuff contained such drugs as strychnine alkaloid, extract of belladonna, aloin, phenolphthalein and thyroid in quantities sufficient to cause serious and irreparable injury to health if used under conditions prescribed in the advertisements or under customary or usual conditions. Another federal agency, the Food and Drug Administration, had already taken action against the same Philadelphia concern, declaring that because of the thyroid and phenolphthalein content found in a shipment of O. B. C. Capsules seized in interstate commerce, these would be dangerous to health when used in the dosage or with the frequency prescribed on the labeling. As the company put up no defense, the consignment in question was ordered confiscated in May 1939.

**Plat-Num Perl Products.**—These were put out by a New York concern operated by A. Sartorius and Company, Inc., using the trade style "Plat-Num Perl Laboratories." It was ordered by the Federal Trade Commission on Dec. 20, 1940, to discontinue certain false and misleading representations in its advertising. Among these were that its "Plat-Num Oil Compound Nail Polish Remover" contains enough olive oil to justify the name and that it would relieve or improve to any appreciable extent the condition of dry, brittle nails; or that its "Plat-Num Nail Protector" encourages nail growth or strengthens the nails, whereas it does nothing of the sort. The concern was further ordered to discontinue using the words "olive oil" or any similar designation.

**Durine.**—This product of the Aurine Company, Inc., of Chicago, was formerly sold as "Aurine." On July 1, 1940, the Federal Trade Commission ordered the concern to cease advertising that the preparation is a cure, remedy or competent or effective treatment for complete or partial deafness; that it possesses any therapeutic value in excess of such aid as it may render in softening coagulated wax in the ear, and that the company makes refunds to dissatisfied purchasers, when in fact it does not maintain a definite policy of making such refunds. In December 1937 the Food and Drug Administration at Washington declared that a shipment of "Durine Application for the Ears," which had been seized in interstate commerce, was fraudulently represented as a remedy for ear troubles. Government chemists reported in this connection that they had found it to be essentially a mixture of glycerin, boric acid, extracts of plant drugs and volatile oils including lavender.

## Council on Medical Education and Hospitals

### SUMMARY OF ELIGIBILITY REQUIREMENTS OF CERTIFYING BOARDS

B. R. KIRKLIN, M.D.  
Secretary American Board of Radiology  
ROCHESTER, MINN.

The task assigned me was to study the requirements for eligibility of candidates for examination and certification as prescribed by the various special boards and to discuss reasons for divergences of these requirements from those recommended by the Advisory Board for Medical Specialties. Accordingly, to make comparison easy, I have tabulated the eligibility requirements listed by the several boards, including not only items concerning which the Advisory Board has offered advice but also those about which it has made no recommendations. In discussing them we should remind ourselves that the recommendations of the Advisory Board are not binding; that some of them need not be complied with before Jan. 1, 1942; that some of the special boards existed and had formulated their rules before the Advisory Board was established; that certain of this board's recommendations have been broadly expressed, leaving considerable latitude for substantial conformity to them; that as to requirements not dealt with by this board the special boards have been free to exercise their judgment, and that each specialty has to consider its own peculiar problems and circumstances.

It is not surprising, then, that there are differences among special boards as to eligibility requirements and divergences from recommendations of the Advisory Board, but it must also be said that the extent of agreement is both surprising and gratifying. At all events, analysis and discussion of the facts may bring out constructive criticism and helpful action by this board. In whatever we do we shall, of course, have to keep in mind the two basic aims of special boards, namely to forestall examination of those who are morally and ethically unfit and certification of those who are incompetent and, at the same time, to avoid demanding unreasonable requirements of applicants who are competent. These aims are equally important, and neither should be promoted by unduly sacrificing the other.

In going over this tabulation I shall express my own opinions freely, sometimes rather positively, not at all because I am confident that I know the answer but because I hope to provoke an equally frank expression of different views.

#### GENERAL REQUIREMENTS

**Fees.**—Seven boards have set the examination fee at \$50, four at \$75, one at \$30, two at \$35 and one at \$100. The average fee charged is \$56.66. For reexamination, three boards require a fee of \$10 and one board requires \$15. One board reduces the fee for the second application from \$50 to \$35. All other boards allow the candidate a second examination without further fee, but he must pay the full fee for subsequent applications.

In fixing fees it is proper to consider the number of practitioners in a specialty, the probable number of yearly recruits, the expenses to be allowed members of the boards, the expense of maintaining headquarters, and the building up of a reasonable reserve for later and perhaps leaner years. These and other factors vary widely among the specialties, and I have no further comment to make regarding fees.

**Membership in American Medical Association.**—All boards except one require membership in the American Medical Association, the Canadian Medical Association or a society recognized by the Council on Medical Education and Hospitals of the American Medical Association. Thus these boards are in accord with the recommendation of the Advisory Board. The exception is the Board of Pediatrics, which exacts no requirement in this respect. The Advisory Board has provided that

exceptions to this requirement may be made by any individual board for good and sufficient reasons.

**License to Practice.**—Eight boards require the applicant to be licensed to practice medicine. Seven boards do not list this requirement in their booklet.

**Limitation of Practice.**—Three boards specify that 100 per cent of the applicant's practice shall be devoted to his specialty. The Board of Obstetrics and Gynecology requires that 100 per cent of the applicant's practice shall be restricted to females. Eligible applicants may do a certain amount of urology, general abdominal surgery or even breast surgery so long as it is all done on female patients. The Board of Neurosurgery requires that 100 per cent of the applicant's practice shall be devoted solely to that specialty alone or in combination with neurodiagnosis. Otolaryngology demands 90 per cent, but ophthalmology may be included in this figure. Psychiatry and Neurology says that limitation need not be complete if the applicant can prove his competence. Radiology uses the phrase "substantial portion of his practice" and at present interprets that to mean not less than 70 per cent. Pathology interprets its words "primarily and principally" to mean not less than 70 per cent. Urology demands only assurance by the applicant that he is engaged in the practice of urology and will so continue. Other boards have no ironclad requirement in this respect.

Concerning this requirement I have some strong opinions. It is reasonable to require the applicant to devote a "substantial portion" of his time, effort and interest to the practice of a specialty or even to practice it "primarily and principally." Otherwise he would seem to have little reason for desiring certification, and his motive for applying would be open to question. But I feel that the requirement of 100 per cent is excessive and unfair. It bars candidates who may be competently practicing a specialty in smaller communities, hospitals, groups and institutions and who are obliged to give part time service in other fields. It also bars any competent aspirant whose special practice is not as yet sufficiently remunerative, obliging him to do other work in addition, but who expects to confine himself to his special field as soon as his practice will support him and hopes that certification will help to increase the amount of his special work. In short, I feel that the competence of the candidate, as determined by examination, is the essential test of his fitness for certification and that if the major portion of his practice is in his special field he should be deemed eligible for examination. Eligibility requirements are proper and desirable, for they avert useless examinations, but they should be construed with the utmost fairness to the applicant, and no board should lay itself open to the accusation that it declines to examine applicants whose practice is not limited exclusively to the specialty even though they prove themselves to be competent.

**Case Reports.**—The Board of Ophthalmology requires ten case reports by the applicant, and fifty are required by Obstetrics and Gynecology and Urology. No other board demands case reports. I have no comment to offer regarding this requirement.

#### PROFESSIONAL EDUCATION

**Medical School.**—All boards except Pediatrics require the applicants to be graduates of a medical school approved by the Council on Medical Education and Hospitals. Obstetrics and Gynecology requires approval also by the Advisory Board. The Board of Pediatrics requires a school approved only by that board. As to applicants educated in foreign schools, Surgery, Anesthesiology and Plastic Surgery say that the school must be "approved" but do not say by whom; Internal Medicine, that their credentials must be acceptable to the Council on Medical Education and Hospitals, Advisory Board and National Board of Medical Examiners; Neurosurgery, a school acceptable to that board; Ophthalmology, a school approved by that board and "he may be required to obtain the certificate of the National Board of Medical Examiners"; Urology, that the applicant must be licensed to practice and have a certificate from the National Board of Medical Examiners; Pathology, that their credentials must be acceptable to the National Board of Medical Examiners and the American Board of Pathology, and Radiology that their credentials must be satisfactory to the Advisory Board.

From the Section on Roentgenology, the Mayo Clinic.  
Read at Round Table Discussion, Advisory Board for Medical Specialties, Chicago, Feb. 16, 1941.

It would seem at first glance that there is a lack of uniformity in dealing with those candidates who graduate from foreign medical schools. I doubt very much that any one of the boards or even the Advisory Board has a list of approved foreign medical schools. All the boards have one common purpose in dealing with applicants who graduate from foreign schools, namely to make certain that they have had adequate medical preparation. It seems to me therefore that, rather than leave it to the judgment of the Advisory Board or of the individual board, it would be much better to require all those who have graduated from foreign medical schools to obtain the certificate of the National Board of Medical Examiners before being admitted to the examination of a special board.

**Internship.**—An internship of one year is required by all boards. Three boards require a general rotating internship; one board calls for either a rotating internship or a straight internship in any branch of medicine; another requires a straight surgical internship or its equivalent in the opinion of the board. Other boards do not specify the character of the services. In my opinion a rotating internship is desirable, because it furnishes a broad foundation.

#### SPECIAL TRAINING

**Graduate Training.**—Two boards (Surgery and Plastic Surgery) demand a graduate training period of five years, although

and Pathology say nothing regarding basic science requirements. Otolaryngology says merely that the candidate must have completed an acceptable course in the basic sciences. Radiology, the only specialty that speaks in terms of time, requires that the applicant devote six months of his three year training to pathology. All other boards require the candidate to have knowledge of the basic sciences, particularly as related to the individual specialty, but do not prescribe time or manner of instruction.

Recently, I understand, it has been rumored that instruction for a year and a half in the basic sciences, during the minimal three year training period, would be recommended by the Advisory Board. I have no knowledge of any such intention and I am not sympathetic toward the idea. As all applicants must be graduates in medicine, all of them must have had instruction in the basic sciences and I can see no reason at all for requiring graduate students to spend a year and a half of their special training in reviewing these fundamentals. On the other hand, I consider it highly desirable, if not imperative, for the student to refresh and enlarge his knowledge of the basic sciences related to his intended specialty. This brings up the problem of how and how long this instruction shall be given. For my part, I am opposed to demanding formal and exclusive instruction for a year or longer. Most of the instruction in the basic sciences, with the possible exception of pathology, can be given along with the clinical training. Concerning the

#### Eligibility Requirements of Boards

Boards	Fees, Dollars	A. M. A.	Full Citizen- ship	License to Practice	Per Cent of Work in Specialty	Case Reports	Intern- ship of 1 Year	Years				Certifi- cates Offered
								Graduate Train- ing	In Basic Sciences	In Clinical Work	Addi- tional Practice	
	50.00	+	+	?	?	10	+	3	?	?	0	1
	50.00	+	+	?	90	0	+	?	?	1-2	2½-3½	1
	100.00	+	0	+	100	50	+	3	?	?	2	1
Ophthalmology and Ophthalmology.....	50.00	+	+	+	?	0	+	3	?	1½	2	1
Pediatrics.....	30.00	0	+	?	?	0	+	2	0	2	2	1
Psychiatry and Neurology.....	50.00	+	0	+	0	0	+	3	?	?	2-3	3
Radiology.....	35.00	+	0	+	70	0	+	3	½	2½	0	4
Orthopaedic Surgery.....	50.00	+	+	+	100	0	+	3	?	2	2	1
Urology.....	50.00	+	0	+	0	50	+	3	?	1½	2	1
Internal Medicine.....	50.00	+	0	?	?	0	+	3	?	?	2	1++
Pathology.....	35.00	+	0	+	70	0	+	3	0	3	1	3
Surgery.....	75.00	+	0	?	100	0	+	5	?	4	0	1
Anesthesiology.....	75.00	+	0	+	100	0	+	2	?	?	2	1
Plastic Surgery.....	75.00	+	+	?	?	0	+	5	?	2	0	1
Neurosurgery.....	75.00	+	0	?	100	0	+	3	?	?	2	1
	56.66	14	6	8		3	15	12	1	8	11	

Plastic Surgery<sup>1</sup> requires that only two years of that time be devoted exclusively to plastic surgery. Ophthalmology and Otolaryngology in combination also require five years. Nine specialties require three years of formal graduate training. Two boards (Pediatrics and Anesthesiology) set the minimal period at two years, and one board (Otolaryngology) prescribes a residency of only one year but recommends two in addition to "an acceptable basic science course." It will be noted that the latter three boards do not as yet require full three years graduate training recommended by the Advisory Board.

The Advisory Board has never intended to regiment the component boards by requiring that uniform graduate training be generally adopted. The question of adequate training in each of the specialties can best be determined within certain limitations by the respective boards. It seems reasonable that for those specialties covering limited anatomic fields or procedures a shorter period of training might be adequate. On the other hand, boards covering wide fields should exercise caution lest they demand a period of special training that is too long as well as too rigid.

**Basic Sciences.**—The Advisory Board as well as most of the fifteen examining boards recommend "graduate training in anatomy, physiology, pathology and the other basic medical sciences which are necessary to the proper understanding of the specialty," but only one board specifies the amount of time that shall be devoted to one of the basic sciences. Pediatrics

manner of instruction, the American Board of Internal Medicine offers a liberal and commendable program.<sup>2</sup> In short, I would leave things pretty much as they are.

**Clinical Training.**—"An active experience of not less than eighteen months in hospital clinics, dispensaries and diagnostic laboratories" is recommended by the Advisory Board. Training time to be applied to the clinical and practical aspects of the specialty is set at four years by the Board of Surgery. Radiology prescribes two and a half years. Pathology requires three years. Pediatrics, Orthopaedic Surgery and Plastic Surgery require two; Otolaryngology, one to two; Dermatology and Syphilology and Urology, each one and a half years. Ophthalmology, Obstetrics and Gynecology, Psychiatry and Neurology, Internal Medicine, Anesthesiology and Neurosurgery apparently do not prescribe any specific allotment of time to be spent in clinical training.

Here again I think that the individual boards are better able to determine the minimal time that should be devoted to the clinical aspects of the respective specialties.

**Additional Period.**—Two years' additional practice after the formal training period are prescribed by nine boards; one to one and a half years by Otolaryngology and one by Pathology. One board (Obstetrics and Gynecology) after March 1, 1942 will require four years. Four boards (Ophthalmology, Radiology, Surgery and Plastic Surgery) have no requirement in this respect. Orthopaedic Surgery alone of all the boards demands that the required additional two years be spent in private practice. All other boards, requiring time in addition

1. The American Board of Plastic Surgery was, at the time these data were collected, an affiliate board of the American Board of Surgery. It will soon be an independent board and will, no doubt, change this requirement.

2. See 1938 booklet, pp. 7-9.



to the formal training, permit the applicant to spend this time either by remaining for further training or as an assistant, or by devoting the time to private practice.

The requirement of a certain number of years in private practice is advantageous in that it gives the special board an opportunity to appraise the candidate's professional integrity as a private practitioner.

In this connection it may be interesting to summarize the length of time that must be spent by the applicant following his internship before he is eligible for examination. The following figures cover the graduate training period plus additional time when demanded: Total time for three of the boards (Ophthalmology, Otolaryngology and Radiology) is three years, and for three of the boards (Pediatrics, Pathology and Anesthesiology) the time is four years. For the remaining nine boards the time is five years. It should be noted also that, if the candidate is applying for both psychiatry and neurology, six years must elapse, and that after March 1, 1942 one board (Obstetrics and Gynecology) will require a total period of seven years.

It has already been stated that one board (Orthopedic Surgery) which requires a total of five years to elapse demands that two years of this time be devoted to private practice without supervision. In contrast, another board (Surgery) which likewise requires a period of five years to elapse does not permit any of this time to be given to private practice without supervision.

My net impression from this review is that, while there are a few instances in which certain requirements are perhaps rather lax, there are more instances in which the conditions for eligibility are unnecessarily stringent. These conditions might be defended on the ground that they are designed to raise standards of practice. I am sure that we all endorse this aim in principle and that all of us cherish high ideals, but we also have to consider the practical side and must avoid trying to force achievement of those ideals too rapidly. Unduly severe requirements seem to reflect the spirit of the guild and to suggest a desire to restrict the number of recruits in a specialty. Now we know that the boards have no such wish, but in our zeal to keep out incompetents we must not overlook the other duty—that of fostering certification of applicants who are really competent. At all events, our primary job is to certify those, and only those, who are competent.

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### NATIONAL BOARD OF MEDICAL EXAMINERS

##### EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in *THE JOURNAL*, May 31, page 2526.

##### BOARDS OF MEDICAL EXAMINERS

ALABAMA: Montgomery, June 17-19. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.  
ARIZONA: Phoenix, July 1-2. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: *Oral examination* (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, July 14. *Written*, San Francisco, June 30-July 3. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

COLORADO: Denver, July 18. *Applications must be on file not later than June 15*. Sec., Dr. Harvey W. Snyder, 831 Republic Bldg., Denver.

CONNECTICUT: *Medical*, *Written*, Hartford, July 8-9. *Endorsement*, Hartford, July 22. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden. *Homoeopathic*, Derby, July 15-16. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: Jacksonville, June 23-24. Sec., Dr. William M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, July 14-17. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDaho: Boise, Oct. 7. Dir., Bureau of Occupational License, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 24-26. Supt. of Registration, Mr. Lucien A. File, Department of Registration and Education, Springfield.

INDIANA: Indianapolis, June 17-19. Sec., Board of Medical Registration and Examination, Dr. J. W. Bowers, Citizens Trust Bldg., Fort Wayne.

KANSAS: Kansas City, June 17-18. Sec., Board of Medical Registration and Examination, Dr. J. F. Hassig, 905 N. 7th St., Kansas City.

LOUISIANA: New Orleans, June 12-14. Sec., Dr. Roy B. Harrison, 1507 Hibernia Bank Bldg., New Orleans.

MAINE: Augusta, July 1-2. Sec., Board of Registration in Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MARYLAND: *Medical*, Baltimore, June 17-20. Sec., Dr. John T. O'Mara, 1215 Cathedral St., Baltimore. *Homoeopathic*, Baltimore, June 17-18. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MASSACHUSETTS: Boston, July 8-11. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MICHIGAN: Ann Arbor and Detroit, June 11-13. Sec., Board of Registration in Medicine, Dr. J. Earl McIntyre, 202-4 Hollister Bldg., Lansing.

MINNESOTA: Minneapolis, June 17-19. Sec., Dr. Julian F. Du Bois, 350 St. Peter St., St. Paul.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 6-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: *Reciprocity with oral examination*, Aug. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW JERSEY: Trenton, June 17-18. Sec., Dr. Earl S. Hallinger, 28 W. State St., Trenton.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 23-26. Chief, Bureau of Professional Examinations, 315 Education Bldg., Albany.

NORTH CAROLINA: Raleigh, June 16-20. Sec., Dr. W. D. James, Hamlet.

NORTH DAKOTA: Grand Forks, July 1-4. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OHIO: *Practical*, June 11 and 14. *Written*, June 12-13. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OKLAHOMA: Oklahoma City, June 11-12. Sec., Dr. James D. Osborn Jr., Frederick.

OREGON: Portland, July 24-26. Final date for filing application is July 9. Exec. Sec., Miss Lorraine M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 8-12. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: July 10. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 23-25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, July 15-16. Dir., Medical Licensure, Dr. J. F. Cook, State Board of Health, Pierre.

TEXAS: Austin, June 16-18. Sec., Dr. T. J. Crowe, 918-20 Texas Bank Bldg., Dallas.

VERMONT: Burlington, June 17-19. Sec., Dr. F. J. Lawless, Richford.

VIRGINIA: Richmond, June 17-20. Sec., Dr. F. W. Preston, 30½ Franklin Road, Roanoke.

WASHINGTON: Seattle, July 21-23. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WEST VIRGINIA: Wheeling, July 7-9. Sec., Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: Milwaukee, June 24-27. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

\* Basic Science Certificate required.

#### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

ARIZONA: Tucson, June 17. Sec., Mr. Franklin E. Roach, Science Hall, University of Arizona, Tucson.

CONNECTICUT: June 14. Address State Board of Healing Arts, 1945 Yale Station, New Haven.

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

IOWA: Des Moines, July 8. Dir., Division of Licensure and Registration, State Department of Health, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

OREGON: Corvallis, July 12. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 20. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH DAKOTA: June. Sec., Dr. G. M. Evans, Yankton.

WASHINGTON: Seattle, July 17-18. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

### Colorado January Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure held at Denver, Jan. 8-10, 1941. The examination covered 8 subjects and included 68 questions. An average of 75 per cent was required to pass. Three candidates were examined, all of whom passed. Nine physicians were licensed to practice medicine by endorsement of a state license and 1 physician so licensed by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine	.....	(1939)	85
Northwestern University Medical School	.....	(1940)	89.5
State University of Iowa College of Medicine	.....	(1940)	86

School	LICENSED BY ENDORSEMENT	Year Endorsement of Grad.
College of Medical Evangelists	.....	(1939) N. B. M. Ex.
University of Michigan Medical School	.....	(1938) Florida
University of Minnesota Medical School	.....	(1939) Minnesota
Washington University School of Medicine	.....	(1934) Missouri
University of Nebraska College of Medicine	.....	(1930) Nebraska
Univ. of Rochester School of Medicine and Dentistry	.....	(1935) New York
Ohio State University College of Medicine	.....	(1930) Minnesota
University of Oklahoma School of Medicine	.....	(1938) Oklahoma
University of Oregon Medical School	.....	(1936) Minnesota
University of Tennessee College of Medicine	.....	(1937) Tennessee



## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Evidence: Osteopath as Expert Witness in Malpractice Suit Against Clinic of Nonsectarian Physicians.**—The plaintiff, a woman aged 75, broke "her left leg below the knee" Nov. 13, 1937. She was taken to the defendant hospital and clinic where roentgenograms were taken, the fracture was reduced and she was attended by nonsectarian physicians. She was discharged from the hospital Jan. 29, 1938. Her leg, however, was "not straight" and was swollen and it was necessary for her to use a cane. She subsequently sued the hospital and clinic for malpractice. She offered as a witness an osteopath who, after viewing roentgenograms taken of the leg at the hospital while the leg was still in a cast, was asked whether or not the roentgenograms showed "a proper setting of that leg." The court refused to permit the osteopath to answer, in effect refusing to permit the witness, because he was an osteopath, to qualify as an expert witness in the case, relying apparently on the theory that when a physician is sued for malpractice his treatment of the patient can be tested only by the rules and principles of the school of healing to which he belongs. To qualify the witness to testify, counsel for the patient then offered to "prove that the method of reduction of fractures by an osteopathic physician and surgeon and by a medical physician and surgeon are the same; that they use the same textbooks and the methods of reduction as taught in the two schools are the same." The trial court refused this offer of proof and later directed a verdict in favor of the defendant hospital and clinic. The plaintiff appealed to the Supreme Court of Missouri, division 1, assigning error in the refusal of the trial court to receive evidence that would have qualified the defendant to testify as to the negligence of the defendant hospital and clinic, which in turn might have constituted sufficient evidence to require the case to be submitted to the jury.

In an action for malpractice, said the Supreme Court, a physician or surgeon is entitled to have his treatment of his patient tested by the rules and principles of the school of medicine to which he belongs, and if he performs the treatment with ordinary skill and care in accordance with his system he is not answerable for bad results. However, this does not mean that no testimony of a practitioner of one school is competent in a malpractice case against a practitioner of another school. A practitioner of the healing art is "competent to express an opinion as to matters of diagnosis and to testify to any scientific fact that is, or ought to be, known to every physician and surgeon of every school or system." As was said by the Supreme Court of Washington in *Swanson v. Hood*, 99 Wash. 506, 170 P. 135:

The rule is not that a physician of another school is not competent to testify, but that a defendant's treatment is to be tested by the general doctrine of his own school, which is a very different thing; in other words, the standard of exclusion of evidence is not the school of the witness, but the premises of his testimony. If the premises from which he testifies, that is to say, the criterion by which he measures defendant's treatment, are those of defendant's own school, the witness is not disqualified merely because he himself belongs to another school. . . . When it once appeared that the osteopathic physician was basing his testimony on the tenet of appellant's own school, his testimony was admissible; its weight was for the jury.

It is apparent, continued the Supreme Court, that in this case the trial judge took the position that the osteopath could not qualify as an expert in the case solely because he was not a graduate of any medical school. In so ruling, the trial court disregarded the ruling of this court in *Grainger v. Still*, 187 Mo. 197, 85 S. W. 1114, 70 L. R. A. 49, that, if "it should appear that both the schools to which the witnesses and the defendant belonged employed the same treatment" to the condition under consideration, testimony as to propriety of treatment would be competent. As to how similarity of methods might be shown, it was said in *Swanson v. Hood*, supra, that

such testimony "is admissible, though it be based on the study of books rather than on his own experience." Here the patient sought to show that the methods of reduction of fractures as taught in the two schools are the same, "not only from [the osteopath's] study of books, but also from experience gained over a long period of time he had practiced with M.D.'s in this and similar fractures," and, furthermore, "that the same textbooks and authorities are used by the followers of both schools" as to treatment of fractures. Whether or not the witness did know what he purported to know was of course another matter, which could go to the weight of his testimony only if he made a prima facie showing of qualifications. He was not even allowed to show what his qualifications were by stating what his experience and study had been. Neither was he permitted to testify as to what was shown by the roentgenograms taken by the defendant when the patient was in the hospital with her leg in a cast; and the basis of objections and rulings did not go to his qualifications to understand and interpret roentgenograms. It was pointed out to the Supreme Court that the Missouri statutes require a doctor of medicine to study and pass examinations in anatomy, physiology and surgery and also impose these requirements on an applicant for a license to practice osteopathy. Other similar studies are required of both physicians and osteopaths. Certainly, said the Supreme Court, reduction of fractures is a very different matter from the treatment of disease by medicine. It does not seem unreasonable that the study and methods of the two schools of practice, that is nonsectarian medicine and osteopathy, would be the same in many respects as to treatment of fractures. Even a layman has some idea about what must be done. We hold, concluded the Supreme Court, therefore, that it was erroneous to refuse to permit the osteopath to show his qualifications and to show the extent of similarity of study and methods of the two schools.

Accordingly, the judgment in favor of the defendant was reversed and the cause was remanded to the lower court for trial.—*Mann v. Grim-Smith Hospital and Clinic*, 147 S. W. (2d) 606 (Mo., 1941).

**Insanity: Permanent Compulsory Detention on Certificate of Two Physicians Illegal.**—A Vermont statute (Public Laws, sec. 4034) provides that no one shall be admitted to or detained in a hospital for the insane except on the certificate of two licensed physicians that the person is insane. By another statute (sec. 4038) a person so certified to as insane, or any next friend or relative, may appeal from the "decision" of the physicians so certifying to the appropriate probate court, which is then to try the issue of insanity with the aid of a jury.

Helen B. Cornell was admitted to Brattleboro Retreat, April 23, 1936, on the certificate of two physicians that she was insane and was detained there until the conclusion of the proceedings here abstracted. In November 1940 she attempted to appeal to the appropriate probate court, which dismissed her petition. The action of the probate court was affirmed by the Supreme Court of Vermont because of the delay of more than four years in applying for an appeal. In *re Helen B. Cornell*, 18 A. (2d) 151. A writ of habeas corpus was then filed on her behalf with the Supreme Court of Vermont, alleging that she was detained in the retreat referred to against her will and that her detention was violative of rights guaranteed to her by the state and federal constitutions.

At common law, said the Supreme Court, a person alleged to be insane, preliminary to the institution of judicial proceedings for the consideration of his mental condition, may be temporarily restrained without legal process if his being at large would be dangerous to himself or others, and such a restraint does not violate any constitutional provision. When, however, the confinement is permanent in nature, in order to be lawful it must be in pursuance to the judgment of a court of competent jurisdiction after such a person has had sufficient notice and adequate opportunity to defend. Notice and opportunity to defend are required by (1) article 10 of the state constitution, which reads in part as follows:

Nor can any person be justly deprived of his liberty, except by the laws of the land, or the judgment of his peers.

and (2) by that portion of the Fourteenth Amendment to the Federal Constitution providing that no state shall "deprive any person of life, liberty, or property, without due process of law." The court concluded that a permanent detention under the circumstances here present was violative of the constitutional rights referred to.

To execute such a certificate as is here in question, said the court, any two qualified physicians may be selected by those interested in having the person confined, regardless of other actuating motives. The physicians are neither designated, appointed nor commissioned by any court or public authority to act in that capacity. The physicians must examine the person within five days prior to executing the certificate under oath. The examination may be made without notice to, or knowledge by, the supposed insane person, and solely on such examination their certificate may be based. The physicians are not obliged to hear any other evidence, even though offered by the person examined or in his behalf to show his sanity, and if they do hear evidence so offered it is as a mere matter of favor on their part. A certificate of physicians executed under such circumstances cannot have the force of judicial determination as to the state of a person's mind. The certificate is not by law returnable to any court, public officer or public office. It is not a warrant, nor a binding order on any one, to commit to an asylum, or to restrain, the person certified to be insane. It is only the written opinion under oath of the physicians that the person is insane and is a proper subject for treatment and custody in some asylum. Having concluded that the confinement of Helen B. Cornell if permanent was illegal, the court also concluded that the detention was not temporary but permanent in character and ordered her discharge from custody.—*In re Cornell*, 18 A. (2d) 304 (Vt., 1941).

**Taxes: Salary of Physician Employed by State Hospital Not Exempt from Federal Income Tax.**—The plaintiff served, on a part time basis, as the senior gynecologist in the Pondville State Cancer Hospital. He was paid an annual salary. While he was answerable to the chief of staff and the superintendent of the hospital for keeping the gynecologic services of the hospital up to a proper standard, neither of these officers exerted any control over him as to the method and type of treatment that was to be accorded to any patient. Having paid a federal income tax, under protest, on his salary for the year 1932, the plaintiff filed suit in the United States district court, D. Massachusetts, to recover the amount paid.

The plaintiff first contended that his income from the hospital was not taxable because the hospital was an agency or instrumentality of the state engaged in an essential governmental function. In the opinion of the court, however, the case of *Cook v. United States*, 26 F. Supp. 253, was determinative of this question. In that case it was held that the Worcester City Hospital was not engaged in an essential governmental function and that a radiologist employed part time therein was not immune from federal income taxes. Neither could the court agree with the plaintiff's contention that his salary was exempt from taxation because of the provisions of the Public Salary Tax Act of 1939. That act subjected to federal income taxes the salaries of state officers and employees but exempted from taxation salaries earned prior to 1939. In the opinion of the court the plaintiff was not an officer or employee of the state but was an independent contractor, and hence did not come within the terms of the Public Salary Tax Act. The court therefore denied the relief sought and the plaintiff appealed to the United States circuit court of appeals, first circuit.

In the oral argument before the circuit court of appeals, the government waived the question as to whether or not the Pondville Hospital was an agency or instrumentality of the state. The only question on appeal, therefore, was whether the plaintiff during the year 1932 was an employee of an agency or instrumentality of the Commonwealth of Massachusetts so that his compensation for services was exempt from taxation under the provisions of the Public Salary Tax Act of 1939. The circuit court of appeals said that the basic distinction between employees who are immune from taxation and independent contractors who are not immune is the degree of control exercised

over their services, along with the hours of work, freedom to engage in other professional activity, continuity of employment and the like. And the question of control is a matter to be settled by the circumstances of each particular case. In those cases in which it has been held that professional men were employees, the court pointed out, it was found that the state or local agency had first call on their services and could make use of their entire time to the exclusion of private pursuits. On the other hand, where professional men have been held to be independent contractors and subject to taxation, stress has been laid on the ability of the taxpayer to carry on private work and the fact that he was simply required to reach a particular result with little or no control over the method of attainment.

The fact that the plaintiff in this case, the court observed, may have been included in the definition of "employee" in the statutory authorizations under which he was hired and pursuant to which his salary was regulated was not controlling. Neither was it vital that the plaintiff, in 1932, was paid on a salary basis rather than on the former fee basis, since the duties performed were the same and the change in the method of compensation was made solely for reasons of economy and not in order to change the relationship between the parties. The method of measuring compensation, in the opinion of the court, was of little significance. The plaintiff, continued the court, was not subject to sufficient control to be considered an employee. He was in complete charge of the gynecologic service at the hospital and no one told him how to treat the patients under his care. The hospital was interested only in the satisfactory coverage of the service. Furthermore, the plaintiff gave up only a small portion of his time to the hospital and was under no obligation to give the hospital patients preference over his private patients. The income he derived from the hospital was but a small proportion of his total annual income. He occupied the same position he would occupy if a single patient paid him a yearly sum to examine him weekly and for the sake of convenience requested a particular form of report and fixed hour for the examination, which the physician might vary by arrangement, and the court found difficulty in considering such a physician as an employee of his patient. Furthermore, observed the court, it is well established that there is no such relation of employer-employee between a hospital and its visiting surgeons sufficient to support an action against the hospital to require it to respond in damages for any negligent treatment of a patient by one of its physicians.

The court concluded, therefore, that the tax in question was legally assessed and collected and that a refund thereof was properly denied. The judgment of the district court against the plaintiff was affirmed.—*Meigs v. United States*, 30 F. Supp. 68 (1939); 115 F. (2d) 13 (1940).

## Society Proceedings

### COMING MEETINGS

- American Association for Thoracic Surgery, Toronto, Canada, June 9-11. Dr. Richard H. Meade Jr., 2116 Pine St., Philadelphia, Secretary.
- American Association on Mental Deficiency, Salt Lake City, June 20-24. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
- American Laryngological, Rhinological and Otolological Society, Los Angeles, June 16-18. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
- American Neurological Association, Atlantic City, N. J., June 9-11. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.
- American Orthopedic Association, Toronto, Canada, June 9-12. Dr. Charles W. Peabody, 474 Fisher Bldg., Detroit, Secretary.
- American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.
- Idaho State Medical Association, Sun Valley, June 18-21. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.
- Maine Medical Association, York Harbor, June 22-24. Dr. Frederick R. Carter, 22 Arsenal St., Portland, Secretary.
- Montana Medical Association of Great Falls, June 24-26. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.
- Pacific Northwest Medical Association, Spokane, Wash., June 25-28. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.
- Utah State Medical Association, Salt Lake City, June 12-14. Dr. D. G. Edmunds, 610 McIntyre Bldg., Salt Lake City, Secretary.

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

### American Journal of Clinical Pathology, Baltimore

11:83-174 (Feb.) 1941

Heparin as Anticoagulant in Sedimentation Tests: Comparative Study. S. W. Sappington and L. M. Gillis, Philadelphia.—p. 83.

\*Transfusion Reactions: Experiences with More Than 3,000 Blood Transfusions. A. S. Wiener, B. H. Orenland, M. A. Hyman and A. A. Samwick, Brooklyn.—p. 102.

Stabilization of High Vacuum-Dried Guinea Pig Complement Before Drying and After Restoration with Water. F. Boerner, E. W. Flodorf and Marguerite Lukens, Philadelphia.—p. 122.

Syphilitic Aneurysm of Heart: Case Report with Review of Literature. C. G. Aronstein and L. Neuman, Washington, D. C.—p. 128.

Seminoma and Teratoma in Same Testis: Report of Case. J. R. McDonald and A. C. Broders, Rochester, Minn.—p. 138.

More Sensitive Biotitration of Optimum Erythrocyte Maturation in Human Anemic States. B. C. Houghton and C. A. Doan, Columbus, Ohio.—p. 144.

Anatomic Diagnosis of Acute Appendicitis. O. Saphir, Chicago.—p. 163.

**Transfusion Reactions.**—Wiener and his associates discuss the reactions occurring among 3,000 transfusions. All blood is typed before transfusing by testing the serum and the cells and cross matching the blood of the donor and the patient. Because of the human factor, even with these precautions there were 2 patients who were given blood of the improper group. In 1 a definite, though not serious, hemolytic reaction occurred. The transfused blood was quickly eliminated from the body of the 2 patients and this was followed by the appearance of immune isoantibodies of high titer in the patient's serum. In the patient of group AB, subgroup A<sub>1</sub>B, who had received two transfusions of group O blood, anti-O agglutinins were observed in the serum. This suggests that the production of immune anti-O isoantibodies should probably be considered in repeated transfusions of blood from universal donors. Other complications occasionally encountered were thrombosis of the vein at the site of injection, at times associated with phlebitis, and suppuration of the wound in cases in which an incision was necessary. These complications were infrequent and never retarded convalescence. The idea that the rapid introduction of blood is dangerous for patients with endocarditis or thrombophlebitis seems to be supported by the sudden death of a patient with subacute bacterial endocarditis during a transfusion by a syringe-valve method. This was the only fatality that must be attributed directly to the transfusion. While the majority of chills following transfusion are caused by nonspecific agents (unclean apparatus) and do not nullify the hemoglobin rise, they may be part of a more serious syndrome. The first step in differentiating nonspecific chills from those of incompatibility of the donor's blood is to repeat the grouping and cross matching tests on samples of blood obtained before transfusion and also on fresh samples to determine whether there has been an error in grouping. The patient's sample taken after transfusion should also be examined for hemoglobinemia and its icterus index. The urine should be examined. When the patient and donor are of the same blood group, tests for M-N should be made. If the M-N types of patient and donor are different, tests on the patient's blood with anti-M and anti-N serums will demonstrate whether the donor's blood is still present in the patient's circulation. If it is present, a hemolytic reaction is excluded. If the M-N types are the same, hemoglobin determinations must be depended on. From five to ten days after transfusion the patient's serum should be matched against the donor's cells to detect any immune isoantibodies which may have formed.

### American Journal of Medical Sciences, Philadelphia

201:157-312 (Feb.) 1941

Blood Pressure Determinations by Patients with Essential Hypertension: II. Difference Between Home and Clinic Readings During and After Treatment. D. Ayman and A. D. Goldshine, Boston.—p. 157.

Azotemia Due to Ingestion of Blood Proteins: Blood Urea Increase Related to Ingestion of Whole Blood, Red Cells, Plasma and Other Proteins. C. L. Yuile and W. B. Hawkins, Rochester, N. Y.—p. 162.

Electrocardiogram During Electric Shock Treatment of Mental Disorders. S. Bellet, A. Kershbaum and W. Furst, Philadelphia.—p. 167.

Changes in Electrocardiogram and in Cardiac Rhythm During Therapeutic Use of Potassium Salts. II. J. Stewart and J. J. Smith, New York.—p. 177.

\*Cardiac Disease Among 28,139 Newly Entering Students at University of Wisconsin. L. R. Cole, Madison, Wis.—p. 197.

Treatment of Addison's Disease with Pellets of Synthetic Desoxycorticosterone Acetate Implanted Subcutaneously. G. Segall, Los Angeles.—p. 202.

Local Use of Sulfanilamide Powder and Hydrogen Peroxide in Wound Infections. L. Schneider, Newark, N. J.—p. 208.

\*Intravenous Use of Sodium Sulfapyridine in Treatment of Pneumonia and Pneumococcal Infections. W. L. Winters, W. W. Fox and R. Rosi, with technical assistance of Dolores Lammers, Chicago.—p. 216.

\*Accuracy of Fluoroscopy in Detection of Pulmonary Tuberculosis. H. L. Israel and H. W. Hetherington, Philadelphia.—p. 224.

Spondylarthritis Ankylopoietica: Review and Report of Twenty Cases. C. L. Dunham, Chicago, and F. G. Kautz, New York.—p. 232.

Nutritional Aspects of Treatment of Arthritis. R. Pemberton and C. W. Scull, Philadelphia.—p. 250.

Waterhouse-Friderichsen Syndrome: Acute Bilateral Suprarenal Hemorrhage. J. W. Lindsay, E. C. Rice, M. A. Selinger and L. Robins, Washington, D. C.—p. 263.

Cerebrospinal Fluid Total Protein in Alcoholic Psychopathies. S. R. Rosen, Albany, N. Y.—p. 270.

Use of Acetyl-Beta-Methylcholine Chloride Iontophoresis in Nonarterial Peripheral Vascular Disease. II. Montgomery, with technical assistance of Sara C. Turner and Elizabeth C. Sammis, Philadelphia.—p. 277.

**Heart Disease Among Students.**—Cole states that among the 28,139 students admitted to the University of Wisconsin between 1931 and 1939 who were given complete physical examinations there were 289 with heart disease. The sex ratio was 1.7 females to 1 male. This is a higher proportion of females than is commonly observed. The mitral valve was most frequently involved and it was clinically diseased in 91 per cent of the cases, the next most frequent site was the aortic valve in 15.5 per cent and there were only 2 cases of involvement of the pulmonic valve. Cardiac enlargement was shown to be present in 31.8 per cent of the patients, and 15.9 per cent had elevated blood pressures. Pericardial changes were observed in 14 cases. Disorders of rhythm were present on the electrocardiograms in 11 cases. More studies of this type, in view of the similarity of circumstances and conditions surrounding college students, would give an additional impetus to furthering preventive medical practice.

### Sodium Sulfapyridine for Pneumococcal Infections.

According to Winters and his collaborators, the advantages of the intravenous administration of sodium sulfapyridine outweigh the disadvantages in the treatment of pneumococcal infections. The material for their study consists of 80 patients with pneumonia who were severely ill at the time of admission or who failed to respond to oral sulfapyridine. The potential toxicity of the drug was considered, but it was decided that treatment of the infection was more important and urgent than its possible toxic effect. Sodium sulfapyridine intravenously should not replace its oral use, but its parenteral use is definitely desirable for patients who are unable to have serum or to retain the drug orally or for those who are unable to cooperate because of coma or delirium. All but 1 of 13 patients who failed to respond to oral sulfapyridine and 4 patients who had a relapse made a prompt favorable response after sodium sulfapyridine was given intravenously. The high mortality (22 deaths) is readily explained by the fact that only those cases with a grave prognosis were selected for treatment with intravenous sodium sulfapyridine. Accidents may follow the intravenous use of sodium sulfapyridine, but these may be avoided by careful preparation and administration of the solution. The authors encountered no severe toxic reactions among their one hundred and fifteen intravenous injections. The response to treatment was more immediate with intravenous sodium sulfapyridine than with oral sulfapyridine. Repeated at intervals of twelve hours a dose of 0.06 Gm. per kilogram of weight maintains a level of from 6 to 15 mg. per hundred cubic centimeters. The fear of reactions following its intravenous administration seems unwarranted and should not limit its more general application.

**Fluoroscopy in Detecting Pulmonary Tuberculosis.**—Israel and Hetherington point out that the duplicate fluoroscopic and roentgen examinations given 1,021 patients who had a history of respiratory symptoms or of exposure to tuberculosis indicate that fluoroscopy provides an accurate method for the detection of pulmonary tuberculosis. In 329 patients abnormalities appeared definite or probable and in the remaining 692 patients in whom no definite abnormality was reported on fluoroscopic examination only 4 had clinically significant tuberculous lesions. Fluoroscopy failed to detect the small apical infiltrations that would be merely observed or disregarded by the clinician in 18 instances. These were not necessarily the obsolete minimal apical lesions which represent, as Hedvall has shown, the earliest roentgen evidence of pulmonary tuberculosis. The lesions described by Hedvall are demonstrable only after the most careful roentgen study and are at present overlooked by most roentgenologists and disregarded by most clinicians. Fluoroscopic examination will detect infiltrations so hidden by superimposed bony structures that they are not detected on single roentgenograms. Infiltrations have been found on fluoroscopic examination of 2 students in whose films, taken at another institution, no certain abnormality could be distinguished. Tuberculous infiltrations can be detected in children with even greater accuracy. Tuberculous tracheobronchial lymph node enlargement, definite on roentgen examination, was detected in all but 2 instances by fluoroscopy. When lymph node enlargement was definite or probable on one method of examination it appeared the same on the other. It is questionable whether roentgen or fluoroscopic examination is the more authoritative in the diagnosis of tuberculous lymph node enlargement and calcified primary lesions. In a number of instances calcification appeared definite on fluoroscopy, while flat roentgenograms showed no abnormality that would warrant such a diagnosis. An even larger proportion of cases in which a calcified primary lesion was diagnosed from flat roentgenograms was considered negative on fluoroscopy.

#### American J. Obstetrics and Gynecology, St. Louis 41:179-354 (Feb.) 1941. Partial Index

- \*Clinicopathologic Investigation of Causes of Menometrorrhagia. E. Henriksen, Los Angeles.—p. 179.
- Role of Fallopian Tubes in Spread of Pelvic Cancer: Report of Case with Brief Review of Literature. O. Wallis, Chicago.—p. 196.
- Erythrocyte Sedimentation Reaction During Pregnancy. C. J. Vogt, Cleveland.—p. 206.
- \*Role of Deep Cauterization in Prevention of Cancer of Cervix: Report of 10,000 Cases. B. Z. Cashman, Pittsburgh.—p. 216.
- Unexpected Postpartum Hypertension. H. Meyer and S. B. Nadler, New Orleans.—p. 231.
- Survey of 425 Cases of Toxemia of Pregnancy. Charlotte A. Jones, New York.—p. 242.
- \*The Endometrium in Tuberculous Peritonitis and in Sterility. R. M. Jensen and J. R. McDonald, Rochester, Minn.—p. 268.
- Contractile Response of Pregnant Human Uterus to Posterior Pituitary Extract: Study of 375 Injections Recorded with Löränd Tocograph. D. P. Murphy, Philadelphia.—p. 274.
- Observations on Possible Relationship of Diet to Late Toxemia of Pregnancy. J. H. Kooser, Hyden, Ky.—p. 288.
- Irradiation of Benign Pelvic Lesions. W. E. Brown, N. R. Kretzschmar, W. S. Peck and J. T. McGreer, Ann Arbor, Mich.—p. 295.
- Clinical Evaluation of Stilbestrol in Women with Hypoplastic Genitalia. H. H. Lardaro, New York.—p. 301.
- Effect of Diethylstilbestrol and Diethylstilbestrol Dipropionate on Postmenopausal Vaginitis and Symptoms. L. A. Gray and J. D. Gordinier, Louisville, Ky.—p. 326.

**Causes of Menometrorrhagia.**—Henriksen lists the clinicopathologic data in 1,500 cases of menometrorrhagia. The series is divided into two groups: Group A includes the 729 cases in which either the specimen removed at operation was obtained or the major factor was visualized or outlined by examination, and group B includes the 771 cases in which the diagnosis was made with the aid of examining endometrial and/or cervical tissue. The major causes of the abnormal bleeding among the first group were unknown in 197, benign cervical lesions in 148, uterine myomas in 108, ovarian in 76, pelvic inflammation in 76, malignant cervical changes in 57, tubal gestation in 27, senile vaginitis in 17, internal endometriosis in 16, urethral in 4 and rectal in 3. In group B the causes were follicular in 187, possibly functional in 124, pubic in 103, endometrial polyps in 102, incomplete menstruation in 82, endometrial hypertrophy in 70, postabortal in 53, inter-

menstrual bleeding in 33, general in 8, postirradiational in 5, tuberculous in 2 and abnormal gestational in 2. All the patients were between 20 and 40 years of age; thus the endocrinopathies of early adolescence and the menopause were not operative. A summary of the cases reveals no typical set of symptoms peculiar to specific pathologic changes of either the uterus or the ovaries. The patient with the minimum of demonstrable changes may bleed more profusely than the one with widespread pathologic pelvic changes. In spite of anatomic lesions, other factors must be considered as probably precipitating the abnormal bleeding. Not only must the problem be approached from an endocrine angle, but the clinicopathologic aspects must not be forgotten or discarded because of the waves of therapeutic and investigative enthusiasm. The misinterpretation of the endometrial patterns and the misapplication of terminology have done much to complicate the present status of investigative and therapeutic work in menstrual aberrations.

**Deep Cauterization for Preventing Cervical Cancer.**—Cashman states that control and prevention of cancer of the cervix do not lie in the method of treatment but in the early diagnosis and adequate treatment of the preexisting lesion, the chronic cervicitis or, even better, in the prevention of cervicitis by proper treatment of the cervix after delivery. The cervix has been cauterized in the material to be reported routinely, since 1914, in all operations for chronic tubal infection, in all subtotal hysterectomies and in all cases of cervical leukorrhea sufficient to warrant radical treatment. The infected cervix was cleaned up in any case in which operation was necessary for other conditions. Deep cauterization has been gradually adopted by gynecologic and obstetric staffs of the University of Pittsburgh Hospitals and there are now (over twenty-five years) 10,000 cases which have been followed up to determine the incidence of cancer in the cervixes so treated. Data were secured concerning 3,143 patients, and 1,341 of them returned for examination. The interval between cauterization and follow-up examination was from one to twenty-four years. Among the 10,000 patients 2 were known to have cancer of the cervix before the follow-up. In the 31.4 per cent follow-up, or 3,143 patients, no additional cases of cancer of the cervix were found. To determine the true prophylactic value of deep cauterization in this series the incidence of cancer among 10,000 gynecologic patients who have had no treatment of the cervix would be necessary. No such series is available, but certain estimates can be made from isolated surveys and published statistics. From this study it appears that the true incidence would probably lie between 19 cancers for 10,000 women in general and 182 for 10,000 gynecologic cases. According to Levin, who has applied accurate and scientific statistical methods to the author's data, the number of patients followed and the average duration of the follow-up were too small to constitute a fair test of the value of cauterization of the cervix in preventing subsequent carcinoma, and the facts obtained in this survey do not indicate that cauterization has any prophylactic value. In view of the importance of settling this question it is to be hoped that follow-up of these patients will continue.

**Endometrium in Tuberculous Peritonitis and in Sterility.**—Jensen and McDonald studied the pathologic changes in the endometria of 75 uteri removed in the course of surgical procedures; 25 of the uteri were removed surgically from women who had borne children and were not suspected of having tuberculosis before operation, 25 from women who had never borne children but were married and desired to have children, and 25 from women who had tuberculosis of the peritoneum verified by microscopic examination. In the first group tuberculosis of the uterus was encountered in 2, or 8 per cent, in the second group the incidence was 4 per cent and in the third group it was 60 per cent. The authors believe that endocervical tuberculosis was found more frequently than has been described previously. It seems likely that if more extensive microscopic study was to be made of the endometrium in routine curettage and hysterectomy the incidence of uterine tuberculosis would be found to be much higher.

**American Journal of Public Health, New York****31:117-218 (Feb.) 1941**

- Maternal and Child Health Programs Under the Social Security Act. E. F. Daily, Washington, D. C.—p. 117.
- The Merit System in Relationship to Public Health Personnel. F. L. Roberts, Memphis, Tenn., and B. Hill, Nashville, Tenn.—p. 121.
- Use of Lauryl Sulfate Tryptose Broth for Detection of Coliform Organisms. W. L. Mallmann and C. W. Darby, East Lansing, Mich.—p. 127.
- Secondary Attack Rates in Pneumonia: Study of 13,500 Household Contacts. E. S. Rogers, M. Robins and Margaret G. Arnstein, Albany, N. Y.—p. 135.
- Laboratory Studies of Methods for Cleansing of Eating Utensils and Evaluating Detergents. F. W. Gilreese and J. E. O'Brien, Albany, N. Y.—p. 143.
- Analysis of Present and Future Health Nurses in the United States. Pearl C.—p. 151.
- Setting Up New for Public Health Nurses. Dorothy Demin.
- Health Maintenance in Small Industry. R. B. Robson, Walkerville, Ont., Canada.—p. 162.
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**Am. J. Roentgenol. & Rad. Therapy, Springfield, Ill.****45:161-320 (Feb.) 1941**

- The Development of the Science of Roentgen Technic; Caldwell Lecture, 1940. G. W. Holmes, Boston; introductory remarks by P. Brown, Egypt, Mass.—p. 161.
- Bleeding Lesions of Gastrointestinal Tract and Their Roentgenologic Diagnosis. B. R. Kirdlin, Rochester, Minn.—p. 171.
- Position of Colon. A. Oppenheimer, Beirut, Lebanon (Syria)—p. 177.
- Age Criteria of Primary Tubercles Revealed by Roentgenologic Study. H. C. Sweeney, Chicago.—p. 187.
- Insufficiency Fracture of Tibia Resembling Osteogenic Sarcoma. G. E. Pfahler, Philadelphia.—p. 209.
- Differential Diagnosis of Renal Neoplasms and Hydronephrosis or Pyonephrosis from Pyelographic Standpoint. B. S. Abeshouse, Baltimore.—p. 214.
- Unoperated Hypernephroma of Ten Years' Duration: Case. H. E. Carlson and N. F. Ockerblad, Kansas City, Mo.—p. 221.
- Sickle Cell Anemia, with Unusual Bone Changes. E. A. Danford, R. Marr and E. C. Elsey, Cincinnati.—p. 223.
- Roentgenographic Evidence in Chest of Injury to Abdominal Viscera: Report of Case. W. Snow, New York.—p. 227.
- Five Year End Results in Cervical Carcinoma Treated with Radium and 800 Kilovolt Roentgen Rays. H. E. Schmitz and J. F. Sheehan, Chicago.—p. 229.
- Physical Study of Intracavitary Radium Therapy. W. V. Mayneord and Joan Honeyburne, London, England.—p. 235.
- Radium Treatment of Cancer of Uterus, with Reference to Physical Measurements of Radiations in Accordance with Investigations of W. V. Mayneord and Joan Honeyburne. E. Hurdon, London, England.—p. 250.
- Effects on Thymus and Testis of Rat When Thymus Is Irradiated. B. Jolles, London, England.—p. 259.
- Pharmacologic Behavior of Sodium Thorium Tartrate and Its Roentgen Diagnostic Value. F. R. Greenbaum and Catherine E. Aye, Philadelphia.—p. 265.

**American Review of Tuberculosis, New York****43:151-318 (Feb.) 1941**

- Tuberculous Cavities: Observations on Transpleural Decompression. A. Goldman, H. Brunn and L. Ackerman, San Francisco.—p. 151.
- Results of Collapse Therapy: Follow-Up Study of Two Groups of Patients Treated, Between 1926 and 1938, Respectively With and Without Collapse Therapy: Data About Life Expectancy and Hospital Mortality Rates. B. P. Potter, Jersey City, N. J.—p. 184.
- Insatiable Pneumothorax. E. Korol, Batavia, N. Y.—p. 190.
- Tuberculous Empyema: Type of Collapse and Extent of Disease as Factors in Its Onset. I. L. Cutler, Rutland, Mass.—p. 197.
- Laminagraphy in Chest Conditions. W. H. Weidman and Jean Kieffer, Norwich, Conn.—p. 202.
- Case Finding in Tuberculosis. R. G. Bloch, Chicago.—p. 213.
- Decline of Tuberculosis: Present Death Rates and Outlook for Future. L. I. Dublin, New York.—p. 224.
- \*Tuberculosis in Students. J. A. Myers, Minneapolis.—p. 235.
- \*Constitution and Diet in Tuberculosis. F. H. Heise, Trudeau, N. Y.—p. 245.
- Pneumococcal Pneumonia Complicating Pulmonary Tuberculosis. G. W. Pedigo Jr., Louisville, Ky., and E. O. Coleman, Waverly Hills, Ky.—p. 258.
- Demonstration of Tubercle Bacilli: Comparative Study of Culture and Guinea Pig Inoculation. K. T. Sasano, D. W. Caldwell, E. L. Needham and E. M. Medlar, Mount McGregor, N. Y.—p. 263.
- Rehabilitation and After-Care of the Tuberculous. T. C. Foster, Washington, D. C.—p. 274.

**Tuberculosis in Students.**—According to Myers, the Tuberculosis Committee of the American Student Health Association reported that 25.5 per cent of 82,774 students examined during the 1938-1939 term reacted to tuberculin. If every test was read correctly, each of these students possessed tuberculous

lesions. Therefore approximately 25 per cent (with variations in different places) of students who enter as freshmen already have the disease in some form as manifested by the tuberculin reaction. They were infected before they entered college; the majority of them are noncontagious at the time of entrance and admission should not be refused. Nevertheless they have tuberculous lesions of at least the primary complex, and an occasional case of clinical tuberculosis should be expected while they are in school. The only solution of the problem is protection against infection throughout the precollage age. Already this is being done with such success that there is an appreciable decrease of tuberculin reactors among entering students. As accurate methods of screening out contagious cases are available, students need not contract tuberculosis while in college. If students are kept under sufficiently close observation, only rarely will a student enter with a contagious stage of the disease or will a case develop on the campus and dissemination to other students occur. No member of the personnel of an institution who has contagious tuberculosis should be permitted direct or indirect contact with the students. Immunization and vaccination studies against tuberculosis have resulted only in controversy; therefore the weapons to employ are those found of universal value. Definitely established facts, when properly applied, are sufficient to control the disease on any campus.

**Constitution and Diet in Tuberculosis.**—Heise declares that the evidence that resistance or susceptibility to tuberculosis is largely an inherited quality has been obtained from (1) the incidence of the disease and its fatality in the general population during successive years, (2) the effect of tuberculosis on racial stocks, (3) its effect on masses of people recently in intimate contact with it, (4) its incidence and fatality rate in family trees or stocks over long periods of time, (5) difference in incidence between fraternal and identical twins living in the same environment and (6) experimental work on animals. The inherited resistance can be strengthened or weakened by the food eaten. Evidence of this is had from studies of the effect of food shortages on populations during war and other economic disasters. Also that the resistance can be enhanced by feeding larger than usual quantities of qualitative or protective foods has been shown experimentally. The isolation of a patient with open tuberculosis has reduced the chances of infecting others and perhaps lessened the infecting dose and possibly repeated infections. Natural laws have acted to weed out the susceptible in successive generations. Better dietary habits have enhanced inborn resistance to all diseases, including tuberculosis. The inherited constitution and the better understanding of nutrition have played their part in reducing the tuberculosis mortality rate.

**Annals of Surgery, Philadelphia****113:321-480 (March) 1941**

- Cancer of Breast. C. Eggers, T. de Cholnoky and D. S. D. Jessup, New York.—p. 321.
- \*Nipple Discharge: Clinicopathologic Study. P. R. Hinchey, Salem, Mass.—p. 341.
- Surgical Treatment of Tumors of Mediastinum. G. J. Hener, New York.—p. 357.
- Heterotopic Pancreatic Tissue Producing Pyloric Obstruction: Review and Case Report. E. G. Krieg, Detroit.—p. 364.
- Heojunitis. B. B. Crohn and A. M. Yunich, New York.—p. 371.
- Nephro-Omentopexy and Nephromyopexy in Treatment of Arterial Hypertension. M. Bruger and R. F. Carter, New York.—p. 381.
- \*Malignant Melanoma: Clinical Study of 117 Cases. T. de Cholnoky, New York.—p. 392.
- \*Smoking and Thromboangiitis Obliterans. F. V. Theis and M. R. Freeland, Chicago.—p. 411.
- Rate of Healing of Tendons: Experimental Study of Tensile Strength. M. L. Mason and H. S. Allen, Chicago.—p. 424.
- Partial Myotomy in Treatment of Divided Flexor Tendons of Hand: Report of Two Cases. L. Blum, New York.—p. 460.
- Dislocation of First Cervical Vertebra. D. P. Willard and J. T. Nicholson, Philadelphia.—p. 464.

**Nipple Discharge.**—Hinchey discusses the frequency, type and etiology of discharge from the nipple as seen in 67 cases. The series excludes cases of discharge from inverted nipples or from ulcerated nipples found in cases of Paget's disease. Carcinoma, chronic cystic mastitis and papilloma were the three lesions responsible for about three fourths of the cases. The papilloma is a precancerous condition, and chronic cystic mastitis, with epithelial hyperplasia, is also to be regarded as precancerous. Twenty-four of the women had cancer; in 12



the discharge was nonsanguineous. In 11 women the discharge was the first warning of disease of the breast, and 4 women had no mammary mass at the first examination. Contrary to common experience, chronic cystic mastitis was encountered more than twice as often as papilloma. The discharging breast in which no mass is palpable must be suspected of harboring not only the precancerous conditions of a papilloma or chronic cystic mastitis with epithelial hyperplasia but even actual cancer. Treatment consists in local surgical excision or mastectomy. Irradiation has not proved of value. A few cases require merely observation, but the surgeon should make this group as small as possible by considering all the possible surgical indications. Thus will important cancer-preventive surgery be performed and occasionally an early, impalpable cancer be discovered. There are five groups of patients with nipple discharge and no tumor in which surgery, in the author's opinion, is definitely indicated: (1) nipple discharge with positive transillumination, (2) nipple discharge with positive pressure test, (3) nipple discharge with localized nodularity in the breast, (4) nipple bleeding after the menopause and (5) continued nipple bleeding of undetermined origin. The presence of blood in the discharge is significant, but its absence cannot rule out a dangerous lesion. Diagnosis is established by the finding of a continuous milky or a greenish yellow discharge which respectively indicate galactorrhea or duct stasis.

**Malignant Melanoma.**—De Cholnoky believes that lack of information concerning the extremely malignant lesions (melanomas) that may arise from moles following trauma or chronic irritation is responsible for the patients' long delay in seeking treatment. The results obtained by surgery are encouraging, but improper treatment or irritation of pigmented lesions must be prevented. Collaboration between the public, practitioners and surgeons is desirable for eliminating those pigmented areas which may undergo malignant degeneration. Beauty parlors, chiropodists and the like need to be warned about the possible consequences of insufficient treatment of the dark pigmented moles. Darkly pigmented nevi which are subjected to irritation should be excised or coagulated. Chemical irritations, caustics and electric methods which do not destroy the entire lesion are to be avoided. Roentgen ray and radium therapy may destroy a local lesion, but authenticated cures following their use are rare; therefore it is not recommended for operable cases. Electrocoagulation followed by lymph node dissection may be desirable for destroying the local lesion. Radical surgery is the treatment of choice and should consist of wide local excision including surrounding subcutaneous fat tissue and underlying fascia, followed by regional lymph node dissection. Removal of the lymphatic vessels in the subcutaneous fat tissues around the lesion and between the lesion and the regional lymph nodes may be desirable in irritated lesions. Amputation of the fingers, toes and foot is advocated for anatomic reasons. This may improve the percentage of "five year arrests," which today occur in about one third of the cases. The author's statistics of 117 cases show five year arrests in 42.3 per cent and ten year arrests in 19.2 per cent of the cases. Untraced cases were reported as deaths.

**Smoking and Thromboangiitis Obliterans.**—According to Theis and Freeland, tobacco smoking was usually accompanied by a greater reduction in the oxygenation of the arterial blood in patients with thromboangiitis obliterans than in normal persons. The extent of the reduction seemed to be influenced by physiologic adjustments in the blood pressure, pulse rate and peripheral skin temperatures. Occasionally, when a decided increase in blood pressure and pulse rate followed smoking, the oxygen saturation of the arterial blood was found increased. The increase was greatest in patients recovered from thromboangiitis obliterans who, after a period of abstinence from smoking, had particularly low oxygen saturation. Failure of physiologic adjustments to compensate for the lowered oxygen tension in the tissues and internal organs may be an etiologic factor in thromboangiitis obliterans. The increased viscosity and other changes in the blood in thromboangiitis obliterans may be evidences of disturbed tissue metabolism. All subjects (16 normal persons, 19 patients with thromboangiitis and 10 with nonthromboangiitis obliterans) were stabilized in bed at room temperature for one hour with the body and extremities

covered by one sheet. Repeated observations were made on the blood pressure, pulse rate, respiratory rate and the cutaneous temperature of the toes and fingers. Arterial blood was obtained from the right radial artery and venous blood from the right antecubital vein. After stabilization and initial observations, successive cigarets were smoked at intervals of fifteen minutes and the foregoing studies made.

## Archives of Dermatology and Syphilology, Chicago

43:435-606 (March) 1941

- Sulfonated Oil as Detergent for Diseases of Skin. C. G. Lane and I. H. Blank, Boston.—p. 435.
- \*Treatment of Herpes Simplex with Moccasin Snake Venom. A. A. Fisher, New York.—p. 444.
- Theoretic Considerations and Clinical Use of Grenz Rays in Dermatology. F. Kalz, Montreal, Canada.—p. 447.
- Exfoliative Dermatitis Due to Phenobarbital: Clinical and Postmortem Study of Case, with Review of Literature on Visceral Lesions in Cases of Drug Eruptions. N. J. Winer and R. L. Baer, New York.—p. 473.
- Severe Generalized Blastomyetic Dermatitis: Report of Case. J. D. Bush, University, Ala.—p. 485.
- Congenital Syphilis in Identical Twins with Dissimilar Serologic Reactions: Report of Case. E. Wolk, Boston.—p. 491.
- Dermatofibroma. J. F. Stecker and W. L. Robinson, Toronto, Canada.—p. 498.
- \*Nonpellagrous Eruptions Due to Deficiency of Vitamin B Complex. P. Gross, New York.—p. 504.
- Comparison of Clinical and Pathologic Diagnoses of Malignant Conditions of Skin. Frances A. Torrey and E. A. Levin, San Francisco.—p. 532.
- Treatment of Psoriasis with Lemon Citrin (Vitamin P), Citrin Lemonade and Ascorbic Acid. A. E. Goldfarb, Floral Park, N. Y.—p. 536.
- Control of Axillary Hyperhidrosis by Aluminum Phenolsulfonate. R. S. Weiss and M. D. Marcus, St. Louis.—p. 539.
- Herpetic Stomatitis (Aphthous Stomatitis). A. R. Woodburne, Grand Rapids, Mich.—p. 543.

**Moccasin Snake Venom for Herpes Simplex.**—While treating a patient with blistering doses of ultraviolet rays for depressed acne scars, Fisher noticed that even mild erythema doses caused severe herpes simplex to recur in a certain area on the cheek, precluding further treatment. A moderately severe sunburn would also cause herpes to appear in the same area. The patient was given two doses of moccasin snake venom, 0.2 cc. of a 1:3,000 dilution, at intervals of one week. Three weeks after the second dose herpes no longer appeared even after exposure to strong erythematous and blistering doses of ultraviolet rays. The immunity has so far lasted for eighteen months. The treatment has been tried in 10 other cases of herpes of various parts of the face and in 4 cases of herpes progenitalis. Not enough time has elapsed to evaluate fully the importance of the method in these cases, but so far it has been effective. Most patients received two doses of snake venom, 0.2 cc. of a 1:3,000 dilution, subcutaneously one week apart. Within a half hour after the injection the site of the injection became moderately tender and swollen. The patients described the reaction as a sensation like that of being struck on the arm. The sensation disappeared in from three to four hours after the injection. In 3 patients, given more than two injections, swelling, redness and itching developed at the site of injection and subsided in from eight to ten hours. There were no general reactions. Moccasin snake venom may be effective in cases in which smallpox vaccination fails.

**Nonpellagrous Eruptions Due to Vitamin B Deficiency.**—Gross reports 13 instances of a cutaneous eruption not quite conforming with any well known dermatologic entity. The common feature in all of the patients was their response to parenteral liver therapy, which suggested that the eruptions were due to a deficiency of the vitamin B complex. Diagnosis of pellagra was not permissible, as the cutaneous manifestations were not typical of the disease, nor were they associated with mucous membrane lesions of the mouth, gastrointestinal disturbances or mental symptoms. The classification as nonpellagrous eruption due to deficiency of the vitamin B complex seemed justified. It is the author's impression that the condition in his cases in many ways follows the pattern of the cutaneous manifestations of well defined deficiency diseases (ariboflavinosis, pellagra, tropical avitaminosis and the Plummer-Vinson syndrome). The extensive and localized eruptions responded to treatment with liver extract. He suggests that the condition is a vitamin B complex deficiency and that the deficiency is due to low intake only in occasional instances. More commonly it is based on a constitutional predisposition

which may be identified with the so-called seborrheic diathesis. He makes no claim for a curative effect of liver therapy in the average case of seborrheic eczema, but further studies and a more rational therapy with synthetic products are necessary to clarify the role of vitamin therapy in this disease. Extensive monilial infections of the skin, vulval and anal eczema, kraurosis vulvae and arspitenamine dermatitis have responded promptly to liver therapy. The relation of monilial infection to diabetes is reviewed from the newer knowledge of a vitamin B complex deficiency in persons with diabetes.

### Archives of Pathology, Chicago

31:285-410 (March) 1941

- Aberrant Mucosa in Esophagus in Infants and in Children. L. E. Rector and M. L. Connerley, Boston.—p. 285.  
Organismal Differentials: Further Investigations of Their Effects on Distribution of Leukocytes in Circulating Blood. H. T. Blumenthal, St. Louis.—p. 295.  
Young Reticulated Argentophilic Form of Epithelioid Tubercle. D. Symmers, New York.—p. 304.  
Morphologic Alterations in Regressing Brown-Pearce Tumor and Their Relation to Changes Due to Irradiation. M. Appel, O. Saphir and A. A. Strauss, Chicago.—p. 317.  
Myoepithelium in Sweat Gland Tumors: Distribution, Histology, Embryology and Function. W. H. Sheldon, Brookline, Mass.—p. 326.  
Congenital Bicuspid Pulmonary Valves. S. Koletsky, Cleveland.—p. 338.  
Chordal Ectopia and Its Possible Relation to Chordoma. T. Horwitz, Philadelphia.—p. 354.  
Value of Mallory's Aniline Blue Stain in Histophysiologic Diagnosis of Goiter. C. A. Hellwig, Wichita, Kan.—p. 363.  
Anatomic Basis for Auricular Fibrillation. W. C. Hutcheson, New York.—p. 369.  
Cardiac Hypertrophy and Coronary Arteriosclerosis in Hypertension. J. R. Kahn and E. S. Ingraham Jr., Cleveland.—p. 373.  
Malformations of Lung. G. E. Gruenfeld and S. H. Gray, St. Louis.—p. 392.

### Archives of Surgery, Chicago

42:453-642 (March) 1941

- \*Fluid Replacement in Surgical States, with Particular Reference to Transfusion of Ascitic Fluid: Clinical and Experimental Study. U. Maes and H. A. Davis, New Orleans.—p. 453.  
Improvement in Blood Transfusion Service: II. Establishment and Operation of Blood Transfusion Service. P. Hoxworth and C. Skinner, Cincinnati.—p. 480.  
Id.: III. Results of 3,077 Transfusions of Bank Blood: Statistical Analysis. P. Hoxworth and C. Skinner, Cincinnati.—p. 498.  
Resection of Colon by Intussusception: One Stage Interiorization Procedure Resulting in End to End Anastomosis. G. O. Wood, Nashville, Tenn.—p. 508.  
\*Postoperative Hypoprothrombinemia and Anesthesia. J. G. Allen and H. Livingstone, Chicago.—p. 522.  
Congenital Elevation of Scapula. A. D. Smith, New York.—p. 529.  
Fractures and Dislocations of Cervical Portion of Spine: Review of Eighty-Nine Cases. W. A. Clark, Pasadena, Calif.—p. 537.  
Vertebral Compression Fractures Sustained During Convulsions. S. Androp, E. S. Margolin, J. H. Marshall and Miriam Rittenhouse, Catonsville, Md.—p. 550.  
Extra-Articular Osteosynthesis for Nonunion of Fracture of Neck of Femur. M. S. Henderson, Rochester, Minn.—p. 557.  
Periosteal Fibrosarcoma. M. Batts Jr., Grand Rapids, Mich.—p. 566.  
Inguinal Endometrioma: Case. D. C. Patterson, W. A. Geer and Estella M. Strayer, Bridgeport, Conn.—p. 577.  
Timing Operative Intervention for Acute Intestinal Obstruction. J. D. Koucky and W. C. Beck, Chicago.—p. 581.  
Primary Carcinoma of Gallbladder. D. P. Greenlee, R. C. Hamilton and F. P. Ferraro, Pittsburgh.—p. 598.  
Review of Urologic Surgery. A. J. Scholl, Los Angeles; F. Himmann, San Francisco; A. von Lichtenberg, Budapest, Hungary; A. B. Hepler, Seattle; R. Gutierrez, New York; G. J. Thompson, J. T. Priestley, Rochester, Minn.; E. Wildholz, Bern, Switzerland, and V. J. O'Connor, Chicago.—p. 611.

**Fluid Replacement in Surgical States.**—Maes and Davis consider the abnormal physiologic picture which follows loss of water, plasma, electrolytes and blood, the technic of fluid replacement and the present status of transfusion of ascitic fluid. Minor grades of dehydration uncomplicated by large losses of electrolytes or blood may be treated by giving water orally or rectally. Many dehydrated patients may require treatment with fluids intravenously. Electrolyte replacement in the presence of dehydrated states in which there is some loss of sodium, potassium and chloride ions may be deferred until hydration has been partially accomplished by means of isotonic dextrose solutions. As electrolytes diminish, the organism's ability to retain water decreases proportionately. The effects of a gradual loss are anorexia, nausea and a tendency toward muscular and mental fatigue and cramps. Some of the surgical causes which may result in loss of electrolytes are artificial openings in the intestinal tract (jejunostomy, ileostomy

or cecostomy) and prolonged drainage from a biliary fistula. Other causes are prolonged diarrhea, discharges from suppurating wounds, prolonged use of Wangenstein or Miller-Abbott gastrointestinal tubes, vomiting due to obstruction and excessive perspiration. Estimation of the level of plasma sodium chloride, which varies normally from 560 to 630 mg. per hundred cubic centimeters of blood, gives a direct clue to the extent of electrolyte loss. A study of the secondary effects of electrolyte loss provides an indirect method. Hypertonic solutions to replace electrolytes are contraindicated. An isotonic solution of 5 per cent dextrose with 0.9 per cent sodium chloride provides an excellent replacement fluid. The electrolyte loss plus the basic electrolyte requirement provides a clue to the amount of solution to be administered. If secondary dehydration has reached the stage of reduction of blood volume, it should be restored by blood transfusion or preferably by plasma or ascitic fluid transfusion. Thereafter, electrolyte solutions may be administered. When sodium is lost, with resultant acidosis and dehydration, relatively larger amounts of solutions of electrolytes may be administered. Desoxycorticosterone acetate will help to fix the sodium and, consequently, the water in the tissues. When the loss is confined mainly to the chloride ion with resulting alkalosis and dehydration, relatively smaller amounts of electrolyte solutions may be given. Fresh whole blood is the most efficacious fluid for replacing lost blood. If not always available, ideal substitutes, containing one or more of the elements of blood and possessing one or more of the biologic properties of blood, are preserved blood, hemoglobin in solution, blood plasma and serum and ascitic fluid. Even though ascitic fluid contains no hemoglobin, its use in acute loss of whole blood is rational as in such states there is usually enough hemoglobin remaining to carry on the respiratory functions of the blood. Only 3 Gm. of hemoglobin per hundred cubic centimeters of blood is necessary to maintain adequate oxygenation. The effects of loss of plasma or plasma-like fluid from the blood stream are dependent on the rate of loss and the nature of the fraction (aqueous or protein) lost. In acute loss of plasma with hemoconcentration and its sequelae, fluid should be replaced before the capillary walls have been irreversibly damaged by oxygen lack. Crystalloid and acacia solutions are contraindicated. The presence of hemoconcentration and increased viscosity of the blood suggests that solutions of normal human proteins without red blood cells might prove more effective than whole blood. Such solutions are plasma, serum and human ascitic fluid. If dehydration complicates the acute loss of plasma, crystalloid solutions may be given, but only after the plasma volume has been restored by protein-containing solutions. The most trustworthy criterion of the amount of plasma lost is the level of oxygen saturation of the blood. The therapeutic problem in chronic loss of plasma protein is correction of the disturbance of distribution of the body fluids resulting from lowering of the osmotic pressure of the blood. Therefore only protein-containing fluids (whole blood, plasma, serum and ascitic fluid) are indicated. Acacia solutions are contraindicated because of their deleterious action on protein regeneration. The danger of intravenous hypertonic and isotonic solutions of sodium chloride should be kept in mind when hypoproteinemia is present, as edema of the body tissues may be precipitated and such "salt" edemas are apt to resist treatment. Desoxycorticosterone acetate is contraindicated.

**Postoperative Hypoprothrombinemia and Anesthesia.**—Allen and Livingstone determined the prothrombin of 106 patients who underwent surgical procedures other than that of the biliary tract. Except in 1 case, no postoperative change was found in the prothrombin levels when ether, vinethene, nitrogen monoxide, ethylene-oxygen, avertin with amylene hydrate, nupercaine, spinal or local anesthesia was used. Loss of blood encountered at operation was determined on 11 patients and it was found that as much as a 785 cc. loss did not reduce the level of plasma prothrombin. In all but 2 of 13 patients with obstructive jaundice and 2 patients with bile fistulas who received preoperative vitamin K therapy for correction of prothrombin deficiency a sharp postoperative drop in prothrombin occurred despite the correction. The authors suggest that storage of vitamin K or prothrombin probably occurs within the body and that the failure to replenish this store in patients with obstructive jaundice or biliary fistula probably accounts for their postoperative hypoprothrombinemia.

**Arkansas Medical Society Journal, Fort Smith**

37:207-228 (March) 1941

- The Climacteric: Some Phases in Its Management. W. P. Sadler, Minneapolis.—p. 207.  
Brief Résumé of the 1937 Epidemic of Poliomyelitis in Little Rock, Ark., and Vicinity. H. S. Stern, Little Rock.—p. 210.

**Bulletin New York Academy of Medicine, New York**

17:165-242 (March) 1941

- What Is the New York Academy of Medicine? M. Goodridge, New York.—p. 165.  
Medical Aspects of Arterial Hypertension. E. V. Allen, Rochester, Minn.—p. 174.  
Pneumococcal and "Virus" Pneumonia. H. A. Reimann, Philadelphia.—p. 187.  
Newer Knowledge of Vitamin B Complex. N. Jolliffe, New York.—p. 195.  
Osteomyelitis and Pyogenic Infections of Joints. M. Cleveland, New York.—p. 205.  
Prevention and Treatment of Infection in Wounds Both Operative and Accidental. F. L. Meleney, New York.—p. 221.

**Endocrinology, Los Angeles**

28:341-520 (March) 1941. Partial Index

- Induction and Course of Permanent Diabetes Produced by Anterior Pituitary Extract. F. C. Dohan, C. A. Fish and F. D. W. Lukens, Philadelphia.—p. 341.  
\*Hepatic Glycogen Reserves in Diabetes Mellitus. I. A. Mirsky, M. Kornberg, N. Nelson and W. E. Nelson, Cincinnati.—p. 358.  
Agents Promoting Gastrointestinal Absorption of Insulin. P. J. Hanzlik and W. C. Cutting, San Francisco.—p. 368.  
\*Clinical Trials with Insulin-Quinine Mixtures by Mouth in Diabetics. W. C. Cutting and G. B. Robson, San Francisco.—p. 375.  
Quantitative Precipitation of Urinary Gonadotropin of Normal Men and Women. L. Levin, New York.—p. 378.  
Thyroid Hormone in Blood and Tissues in Relation to Basal Metabolic Rate. J. F. McClendon and W. C. Foster, with clinical assistance of W. G. Kirkland, Philadelphia.—p. 412.  
Effect of Hysterectomy on Ovary, with Reference to Possible Hormone Action of Endometrium on Ovary. D. R. Mishell and L. Motyloff, New York.—p. 436.  
Effect of Long Term Stimulation of Male and Female Rats with Estrone, Estradiol Benzoate and Testosterone Propionate Administered in Pellet Form. J. Mark and G. R. Biskind, Baltimore.—p. 465.  
Rate of Absorption and Effects of Testosterone Propionate Pellets on Mice. C. D. Koelakian, Rochester, N. Y.—p. 478.  
Inhibition and Stimulation of Testes in Rats Treated with Testosterone Propionate. H. Shay, J. Gershon-Cohen, K. E. Paschakis and S. S. Fels, Philadelphia.—p. 485.  
Effect of Testosterone Propionate on Rat Testis. H. S. Rubinstein and A. A. Kurland, Baltimore.—p. 495.  
Effect of Oral Administration of Methyltestosterone on Fatigue in Eunuchs and Castrates. E. Simonson, W. M. Kearns and N. Enzer, Milwaukee.—p. 506.  
Treatment of Vitiligo by Local Injections of Melanophore Hormone. J. C. M. Fournier, J. M. Cervino and O. Conti, Montevideo, Uruguay.—p. 513.

**Hepatic Glycogen Reserves in Diabetes Mellitus.**—Mirsky and his associates developed a procedure whereby by the administration of phlorhizin it may become possible to gage the capacity of the human liver to maintain a normal concentration of glycogen. The renal threshold for sugar is lowered by the phlorhizin, and a sudden and rapid drain of sugar from the blood stream occurs. This results in a compensatory increase of hepatic glycogenolysis in an attempt of the liver to maintain the blood sugar level, thereby depleting its glycogen reserves. The loss of sugar via the kidneys can be measured in the urine. As long as the blood sugar level remains unchanged, the excreted dextrose must represent dextrose secreted by the liver, liver glycogen. However, when the level of the blood sugar decreases, the dextrose excreted in the urine represents not only dextrose which has been secreted by the liver but also some free sugar which was originally present in the blood and other body fluids. By appropriate calculations the sugar which must have originated in the liver can be estimated. If acetoneuria occurs concomitantly with the hypoglycemia, it becomes evident that the liver has had only minimal amounts of glycogen and that the sugar in the urine now takes origin from newly formed dextrose in the liver. If the liver of the diabetic patient cannot retain normal amounts of glycogen, phlorhizin with the consequent decrease in renal reabsorption of dextrose will lower the blood sugar level, while the blood of a normal subject will show no change after losing the same amount of sugar. The more severe the metabolic disturbance, the greater will be the loss of glycogen and hence the greater the rapidity with which a decrease in the blood sugar

level will occur. Therefore the ease with which hypoglycemia and acetoneuria develop in consequence of dextrose removal via the kidneys provides a means for gaging the glycogen "reserves" of the liver of diabetic patients. The procedure was carried out on 25 normal and 23 diabetic adults and 25 normal and 15 diabetic children. All were permitted to have their regular evening meal, and at 9 p. m. orange juice or cane sugar to furnish 2 Gm. of carbohydrate per kilogram of body weight was provided for storage as hepatic glycogen. The next morning no breakfast and no food during the test were permitted. The diabetic subjects did not receive their morning dose of insulin, and those receiving protamine zinc insulin were given regular insulin the day before the test. The test was begun at 7:30 a. m. and completed six hours later. Water was allowed as desired. A sample of blood was drawn at the beginning and again at the end of the test and was analyzed for its sugar content and for total acetone bodies. Immediately after the first sample of blood, 1 Gm. of phlorhizin dissolved in tenth normal sodium hydroxide was injected intravenously. The subject then emptied his bladder. Another gram of phlorhizin was administered intravenously at the end of three hours in order to maintain a constant glycosuria. The urine was collected during the six hours of the test, and the total amount of dextrose excreted determined. At the end of the test period the patient was permitted to eat so as to compensate for the loss of sugar from the body. The authors found that diabetic adults do not retain carbohydrate in their livers to the same degree as do normal adults and that the removal of relatively small amounts of sugar from their blood stream results in further deprivation of liver glycogen with a consequent hypoglycemia and ketosis. Children cannot retain carbohydrate to the same degree as do adults because of an apparent increased rate of glycogenolysis. This is true not only for diabetic children but also for normal children and accounts for their greater susceptibility to ketosis and coma.

**Insulin-Quinine Mixtures in Diabetes.**—Cutting and Robson state that 7 of 10 patients with mild and severe forms of diabetes reacted beneficially to variable doses of an insulin-quinine mixture by mouth. About half of the patients showed variable degrees of cinchonism. The results obtained are regarded by the authors as encouraging concerning future possibilities of discovering more efficient and less objectionable agents than quinine for promoting gastrointestinal absorption of insulin. Meanwhile, they do not recommend the general use of the insulin-quinine mixtures used by them.

**Florida Medical Association Journal, Jacksonville**

27:373-424 (Feb.) 1941

- Thoracoplasty Program at the Florida Tuberculosis Sanatorium: Preliminary Report. L. H. Kingsbury and W. O. Fowler, Orlando.—p. 385.  
Chronic Empyema. J. W. Snyder, Miami.—p. 391.  
Treatment of Neisserian Arthritis, with Special Reference to Intradermal Therapy. T. H. Davis, Bradenton.—p. 396.  
Rheumatic Chorea in Negro. M. S. Saslaw, Miami.—p. 399.  
Botulism: Its Treatment. M. E. Black, Clearwater.—p. 400.  
Hyperactive Carotid Sinus Syndrome. R. J. Needles, St. Petersburg.—p. 403.

**Georgia Medical Association Journal, Atlanta**

30:41-80 (Feb.) 1941

- Cranio cerebral Trauma. R. F. Slaughter, Augusta.—p. 41.  
Pernicious Anemia in the Negro. J. P. McCracken, Boston.—p. 49.  
Fox Rabies Epizootic in Georgia. T. F. Sellers, Atlanta.—p. 54.  
Carriers of Amebic Dysentery Among Students at the University of Georgia School of Medicine. R. B. Dienst, Augusta.—p. 58.  
Acute Bronchitis. C. H. Holmes, Atlanta.—p. 60.

**Iowa State Medical Society Journal, Des Moines**

31:93-134 (March) 1941

- Common Errors in Diagnosis and Treatment of Anorectal Diseases. R. J. Jackman, Rochester, Minn.—p. 93.  
Variability of Embolic Phenomena in Subacute Bacterial Endocarditis. R. C. Hardin, Iowa City.—p. 95.  
Air-Borne Infection. R. Rooks, Iowa City.—p. 100.  
Use of Sulfathiazole in Gonorrheal Infections of Male: Preliminary Report. M. A. Blackstone and W. K. Ilicks, Sioux City.—p. 104.  
Spontaneous Regression of Malignant Tumors. C. F. Baumeister Sr., Avoca, Calif., and C. F. Baumeister, San Jose, Calif.—p. 106.

**Journal of Experimental Medicine, New York**

73:309-452 (March) 1941

- Hyaluronidases of Bacterial and Animal Origin. K. Meyer, Eleanor Chaffee, Gladys L. Hobby and M. H. Dawson, New York.—p. 309.
- Neutralization of Influenza A Virus by Human Serum. F. L. Horsfall Jr. and E. H. Lennette, New York.—p. 327.
- Complex Vaccine Against Influenza A Virus: Quantitative Analysis of Antibody Response Produced in Man. F. L. Horsfall Jr., E. H. Lennette and E. R. Rickard, New York.—p. 335.
- Role of Renal Metabolism in Hypertension and Uremia. S. Rodbard and L. N. Katz, Chicago.—p. 357.
- Conditional Neoplasms and Subthreshold Neoplastic States: Study of Tar Tumors of Rabbits. P. Rous and J. G. Kidd, New York.—p. 365.
- Experimental Disclosure of Latent Neoplastic Changes in Tanned Skin. I. MacKenzie and P. Rous, New York.—p. 391.
- Experimental Hypoalbuminemia: Its Effect on Morphology, Function and Protein and Water Content of Liver. R. Elman and C. J. Heifetz, with technical assistance of Harriet Wolf, St. Louis.—p. 417.
- Studies on Sensitization of Animals with Simple Chemical Compounds: IX. Skin Sensitization Induced by Injection of Conjugates. K. Landsteiner and M. W. Chase, New York.—p. 431.
- Studies on Experimental Hypertension: XIV. Effect of Intermittent Renal Arterial Occlusion on Blood Pressure of Dog. H. Goldblatt, H. Weinstein and J. R. Kalin, Cleveland.—p. 439.

**Journal Industrial Hygiene & Toxicology, Baltimore**

23:55-92 (Feb.) 1941

- Pathology of Shielded Arc Welding. E. von Haam and J. J. Groom, Columbus, Ohio.—p. 55.
- Acute Oral Toxicity of Acetic, Chloroacetic, Dichloroacetic and Trichloroacetic Acids. G. Woodard, S. W. Lange, K. W. Nelson and H. O. Calvery, Washington, D. C.—p. 78.
- Measurement of Fusion Frequency of Flicker as a Test for Fatigue of the Central Nervous System: Observations on Laboratory Technicians and Office Workers. E. Simonson and N. Enzer, Milwaukee.—p. 83.

**Journal of Lab. and Clinical Medicine, St. Louis**

26:919-1078 (March) 1941

- Clinical Aspects of Sulfapyridine Therapy. R. A. Kilduffe, Atlantic City, N. J.—p. 919.
- \*Hypertension in Relation to Height: Its Variation with Body Build and Obesity. S. C. Robinson, Chicago.—p. 930.
- Studies on Experimental Lesions in Kidneys of Rabbits. A. E. Parks and G. Shanks, Toronto, Canada.—p. 950.
- \*Disturbances in Blood Following Exposure to Benzol. L. J. Goldwater, New York.—p. 957.
- Arterial Circulation of Lower Extremities in Chronic Arthritis. O. Steinbrocker and S. S. Samuels, New York.—p. 974.
- Epinephrine Output from Adrenal Glands in Experimental Hyperthyroidism. J. M. Rogoff, Pittsburgh, and Ruth Cortell, Chicago.—p. 981.
- Blood Sedimentation Rate in Healthy Girls. L. Benson and E. J. Rogers, Pittsford, Vt.—p. 987.
- Studies in Dystrophia Myotonica: V. Creatine and Creatinine Excretion. R. C. Lewis Jr., A. Ravin and R. C. Lewis, Denver.—p. 990.
- Biochemical Studies of Blood of Dogs with N-Propyl Disulfide Anemia. H. H. Williams, Betty Nims Erickson, E. F. Beach and Ieie G. Macy, Detroit; with assistance of I. Avrin, M. Shepherd, Helen Souders, D. M. Teague and Olive Hoffman.—p. 996.
- Influence of Parotid Gland on Blood Sugar: Preliminary Report. W. B. Birnkrant, New York.—p. 1009.
- Serum Cholesterol Studies Following Administration of Acetyl-β-Methylcholine Chloride by Iontophoresis. S. Menber, Ellen McDevitt and J. B. Ludden, New York.—p. 1012.
- Distribution of Doses of Radioactive Phosphorus in Rodents. S. Warren and R. F. Cowing, Boston.—p. 1014.
- Ester-Hydrolyzing Activity of Central Nervous System. D. J. Cohn, I. Kaplan and Martha Janota, Chicago.—p. 1017.

**Hypertension in Relation to Height.**—Robinson states that on the basis of a gross anthropologic study of 2,552 men and 2,021 women blood pressure is shown to be affected by height. In a random group of mixed builds and weights short men and women showed higher mean and modal systolic and diastolic blood pressures than tall men and women. Short men and women showed a higher incidence of high pressures than tall men and women. When the build groups were separated and held constant, a marked difference in blood pressure was observed between tall and short persons and was reversed to the foregoing height relationship. The unequal distribution of lateral build in short and tall persons explains this discrepancy. The tall lateral or broad person was more susceptible to hypertension than the short lateral one. Tall lateral or broad men showed an actual to expected ratio of about two and one half times as many systolic and diastolic hypertensive subjects as short lateral men. Among the tall lateral women there was twice as much systolic and diastolic hypertension as among short lateral women. Tall lateral women showed less than one third the low systolic and diastolic pressures shown by short lateral women. Tall lateral men had a slightly smaller inci-

dence of low pressure than short lateral men. The actual to expected ratio revealed that among linear or thin men the tall men had only one half as many low systolic and diastolic pressures as the short men. The actual to expected ratio indicated no difference between short and tall linear or thin women of low and high pressures. Although the tall person carries a greater hazard of hypertension than any other individual, the larger number of lateral builds among short persons causes the bulk of the hypertensive population to fall among this group. Short individuals show a higher incidence of hypertension than tall ones in any weight group. The three influencing height factors in hypertension are (1) the difference in blood pressure between tall and short persons of specific builds, (2) that between tall and short persons when weight is constant and (3) that between short and tall persons in any group in which build and weight are naturally mixed.

**Disturbances in Blood Following Exposure to Benzene.**—Goldwater studied hematologic changes of 332 individuals who had been exposed to benzene (benzol) for at least six months and up to sixty months. This group of workers were employed in the rotogravure printing industry in New York City. The concentration of the benzene fumes to which they were exposed ranged from 11 to 1,060 parts per million. For comparison, similar studies were performed on workers in a nonhazardous industry. The abnormalities most frequently observed among the benzene workers were anemia, macrocytosis and thrombocytopenia. Leukopenia was present in only a small percentage of the men who had been exposed to benzene. Comparison of the benzene group with the controls indicated that exposure to benzene is likely to result in both relative and absolute lymphopenia. Neutropenia was relatively rare. Monocytosis, lymphocytosis, eosinophilia and basophilia were not found. Prolongation of the bleeding time was rare and did not parallel the reduction in thrombocytes. Prolongation of the coagulation time was also rare. Relatively high hemoglobin values were a common observation. This abnormality was associated with macrocytosis as well as with overloading of erythrocytes with pigment. The erythrocyte sedimentation rate was apparently not altered. Erythrocyte fragility did not seem to be significantly altered on exposure to benzene, but there seemed to be a slight elevation of the serum bilirubin.

**Journal of Nervous and Mental Disease, New York**

93:141-280 (Feb.) 1941

- Psychogenesis of Narcolepsy: Report of Case Cured by Psychoanalysis. A. Missriegler, Vienna, Austria; epitomized translation by B. Karpmann, Washington, D. C.—p. 141.
- Constancy in Manic-Depressive Syndrome. G. W. Kisker, Columbus, Ohio.—p. 163.
- Spine Injuries Following Convulsions from Metrazol and from Idiopathic Epilepsy. I. Schatz and B. E. Konwaler, Colorado Springs, Colo.—p. 169.
- Studies with Methyl Guanidine Sulfate and Its Possible Use as Therapeutic Agent in Mental Disorders. J. J. Madden, L. A. Kaplan and Frances Taylor, Chicago.—p. 176.
- Suicide in Twins: Historical Note. R. D. Loewenberg, San Francisco.—p. 182.
- Myasthenia Gravis, with Special Reference to Morbid Metabolism and Pathology of Disease. J. M. Meredith, Charlottesville, Va.—p. 185.

**Journal of Pharmacology & Exper. Therap., Baltimore**

71:105-202 (Feb.) 1941

- Experiences with Biologic Assay of Several Sympathetic Substances Including Epinephrine. A. M. Hjort, E. J. deBeer and L. O. Randall, Tuckahoe, N. Y.—p. 105.
- Studies on Purified Digitalis Glucosides: III. Relationship Between Therapeutic and Toxic Potency. M. Cattell and H. Gold, New York.—p. 114.
- Anesthesia: III. Pharmacology of Methyl Allyl Ether. J. C. Krantz Jr., C. J. Carr, S. Forman and W. G. Harne, Baltimore.—p. 126.
- Studies of Urinary Excretion of Guanidine Administered Orally to Normal Persons and Patients with Myasthenia Gravis. A. S. Minot and Helen E. Frank, Nashville, Tenn.—p. 130.
- Observations on Toxicology of Sulfathiazole and Some Related Compounds. II. A. Walker and H. B. van Dyke, New Brunswick, N. J.—p. 138.
- Enzymic Inactivation of Substituted Phenyl-Propyl-(Sympathomimetic)-Amines. K. H. Beyer, Madison, Wis.—p. 151.
- Enzymatic Deacetylation of Heroin and Related Morphine Derivatives by Blood Serum. C. I. Wright, Washington, D. C.—p. 164.
- Action of Berberine on Mammalian Hearts. C. S. Jang, Oxford, England.—p. 178.
- Circulatory Action, After Atropine, of Certain Furfuryl Ammonium Iodides and of Acetyl-Beta-Methylcholine Chloride (Mechoyl). E. J. Fellows and A. E. Livingston, Philadelphia.—p. 187.
- Toxicity of Ddauid Injected Intravenously into Mice. M. E. Buchwald and G. S. Eadie, Durham, N. C.—p. 197.

**Journal of Thoracic Surgery, St. Louis**

10:251-372 (Feb.) 1941

- Aseptic Pleuritis Experimentally Produced. J. J. Singer, J. C. Jones and L. J. Tragerman, with technical assistance of Lillian Sherman, Los Angeles.—p. 251.
- Role of Experimentally Produced Intrapleural Adhesions in Extrapleural Pneumolysis and in Prevention of Surgical Atelectasis in Animals. E. M. Hanrahan, Baltimore; R. Adams and R. Klopstock, Boston.—p. 284.
- Treatment of Esophageal Varices by Injection of Sclerosing Solution. H. J. Moersch, Rochester, Minn.—p. 300.
- Standards and Criteria in Artificial Pneumothorax Therapy: Report of Results. R. G. Bloch, W. B. Tucker and W. E. Adams, Chicago.—p. 310.
- Polypoid Bronchial Tumors, with Special Reference to Bronchial Adenomas. A. Goldman and H. B. Stephens, San Francisco.—p. 327.
- Study of 300 Cases of Acute Empyema Thoracis (132 Streptococci and 168 Pneumococci). L. A. Hochberg, Brooklyn.—p. 354.

**Kansas Medical Society Journal, Topeka**

42:45-88 (Feb.) 1941

- Prevention of Toxemia in Pregnancy. C. E. Galloway, Evanston, Ill.—p. 45.
- Tetanus. J. W. Randell, Marysville.—p. 48.
- Diagnosis of Thyroid Malignancy. P. E. Craig, Coffeyville, and C. O. Shepard, Independence.—p. 51.
- Pneumococcal Meningitis in Patient Aged 60 with Recovery: Case Report. H. W. Palmer, Wichita.—p. 54.
- Vaginal Diphtheria: Case Report. S. L. Stout, Wichita.—p. 56.
- Results of Metrazol Treatment. W. W. Corwin and A. C. Voith, Topeka.—p. 57.
- The Problem of the Premature Baby in Kansas. R. F. Boyd, Topeka.—p. 61.
- Treatment of Cerebral Palsy (Spastic Paralysis). M. E. Pusitz, Topeka.—p. 62.
- Spinal Injury (Bullet Wound), Role of Epidural Fat in Producing Neural Symptoms: Report of Two Cases. R. J. Dittich, Fort Scott.—p. 65.
- Traumatic Aneurysm of Scalp. M. A. Walker, Kansas City, and S. S. Caplin, Indianapolis.—p. 69.

**New England Journal of Medicine, Boston**

224:307-350 (Feb. 20) 1941

- Favorable Types of Brain Tumor and Results of Their Operative Removal. G. Horrax, Boston.—p. 307.
- Tuberculosis of Cecum. R. Adams and L. J. Parsons, Boston.—p. 315.
- \*Vitamin C Survey in Diabetics. L. B. Owens, J. Wright and Edna Brown, Cincinnati.—p. 319.
- Postmortem Examination in Rural General Practice. W. F. Putnam, Lyme, N. H.—p. 324.
- Surgery of Sympathetic Nervous System: Role of Vasospasm in Acute Lesions Involving Major Peripheral Vessels. R. H. Smithwick, Boston.—p. 329.

224:351-400 (Feb. 27) 1941

- Hernia as Presenting Complaint in Patients with Cirrhosis of Liver and Ascites. M. D. Altschule, Boston.—p. 351.
- Primary Adenocarcinoma of Jejunum. E. L. Hunt and G. D. Kaneb, Worcester, Mass.—p. 353.
- Trichinosis: Report of Case, with Demonstration of Larva in Arterial Blood. G. J. Dammin, New York.—p. 357.
- Psychiatry: Pharmacologic Shock. V. P. Williams, Boston.—p. 381.

**Vitamin C Survey in Diabetes.**—Owens and his co-workers determined the vitamin C levels of 125 diabetic patients and compared the results with those obtained from 50 control subjects taken at random from the general medical clinic. None of the control patients were on a therapeutic diet. The 125 diabetic patients consisted of 100 unselected "old" diabetic patients followed regularly in the clinic and 25 "new" patients with no previous treatment. The status of the 100 "old" diabetic patients was considerably better than that of the controls but still far below optimal levels; 63 per cent had fasting blood levels below 0.8 mg. of vitamin C and 35 per cent had levels below 0.4 mg. per hundred cubic centimeters of blood. The authors believe that if diet instruction had not been given the blood level would have been in the same low range as in the uninstructed group. The levels of 76 per cent of the "new" diabetic patients were below 0.8 mg. and of 48 per cent they were below 0.4 mg. per hundred cubic centimeters. Exceedingly low levels were found in 50 nondiabetic patients; 90 per cent were below the optimal level of 0.8 mg. and 68 per cent were under the generally accepted critical level of 0.4 mg. The economic status of the nondiabetic patients and the diabetic patients was similar; none could afford the services of a private physician or could pay for hospitalization. Left to select their own diet on a limited allowance, they chose cheap foods that happened to be low in vitamin C. In spite of the low vitamin C

levels, no cases of scurvy were found among the nondiabetic patients. It is seen that the vitamin C status of diabetic patients is improved by diet instruction, even if the food expenditure of the diabetic clinic of the Cincinnati General Hospital is as low as \$2.10 a week per person. An attempt is made to design all diets for diabetic patients so that they are adequate in protein, minerals and vitamins. Diet classes are held weekly to acquaint ambulatory diabetic patients with the benefits of raw fruits and vegetables, in the hope that when possible they will select such foods.

**New Orleans Medical and Surgical Journal**

93:439-490 (March) 1941

- Progress in Treatment of Mental Disease. F. P. Moersch, Rochester, Minn.—p. 439.
- Polyradiculoneuritis: Guillain-Barré Syndrome: Case Report. G. C. Anderson, New Orleans.—p. 443.
- Fatal Paralysis Following Antirabic Treatment. P. H. Herron, Oak Ridge, La.—p. 446.
- Estrogenic Hormone Therapy in Treatment of Presenile and Manic Depressive Psychosis. E. M. Robards, Jackson, La.—p. 450.
- Use of Sulfonamide Drugs in Certain Bacterial Infections. J. O. Weilbaecher Jr., H. J. Dupuy and H. M. Taylor, New Orleans.—p. 455.
- Treatment of Lymphogranuloma Inguinale with Neoprontosil. C. B. Kennedy, J. K. Howles, G. Smullen and M. E. Kopfler, New Orleans.—p. 460.
- Studies on Bleeding Tendency and Vitamin K Therapy in Newborn Children. H. Leidenheimer Jr. and A. S. Albritton, New Orleans.—p. 464.
- Further Studies of Causes of Blindness in Louisiana. H. F. Brewster, New Orleans.—p. 470.
- Ten Year Survey of Antiluetic Therapy at the Eye, Ear Nose and Throat Hospital. W. E. Kittredge, New Orleans.—p. 471.
- Acute Eustachian Tube Obstruction. E. G. Walls, New Orleans.—p. 472.
- \*Use of Prostigmine Methylsulfate in Deafness: Preliminary Report. L. W. Alexander, New Orleans.—p. 474.

**Prostigmine Methylsulfate for Deafness.**—Alexander used prostigmine methylsulfate for 44 cases of chronic catarrhal otitis media with or without tinnitus. Sixteen patients showed good recovery in hearing, 13 stated that their hearing acuity was better (but the audiograms of these patients failed to reveal any improvement), 5 patients with tinnitus were relieved with no improvement in hearing and the remaining 10 showed no improvement. In cases of bilateral chronic catarrhal otitis media in which the hearing was only partly lost in one ear and almost completely lost in the other ear prostigmine methylsulfate produced improvement in the better ear only. Along with catheterization and massage the patients were given 1 cc. of 1:2,000 prostigmine methylsulfate twice a week. Two patients had a recurrence of tinnitus, 1 after a month and 1 after two months. These 2 patients are still under treatment and have shown a definite improvement. The drug changed the character of the tinnitus of the 5 patients with no hearing loss; after the first injection 3 patients were completely relieved and the tinnitus of 2 was lessened to such an extent that it was hardly noticed. These patients were given prostigmine twice a week and no other treatment. Five patients with facial neuralgia were immediately relieved with prostigmine alone, and so far only 1 has had a recurrence and he was again relieved by a single dose of prostigmine.

**New York State Journal of Medicine, New York**

41:419-530 (March 1) 1941

- Foot Function Correlated with Anatomic, Clinical and Laboratory Data. R. P. Schwartz and A. L. Healy, Rochester.—p. 447.
- Immune Globulin (Human) in Modification and Prevention of Measles. H. W. Lyall and P. P. Murdick, Albany.—p. 452.
- Importance of Chronic Sinusitis in Treatment of Bronchial Asthma. R. C. Grove, New York.—p. 455.
- Behavior of Tumors in Tissue Culture at Twenty-Four Hours. E. J. Grace, Brooklyn.—p. 459.
- Supportive Therapy in Bronchial Asthma and Vasomotor Rhinitis. J. S. Stovin, New York.—p. 463.
- Common Glaucoma Operations: Analysis Based on Histologic Findings. T. L. Terry, Boston.—p. 467.
- Early Signs of Serious Gynecologic Lesions. J. R. Miller, Hartford, Conn.—p. 470.
- Ulcerative Colitis. F. H. Lahey, Boston.—p. 475.
- Results of Treatment of Tuberculosis in Trachea and Bronchi. J. D. Kernan and A. J. Cracovaner, New York.—p. 482.
- Clinical Course in Ventricular Aneurysm. H. Gross and J. B. Schwedel, New York.—p. 485.



# Northwest Medicine, Seattle

40:35-74 (Feb.) 1941

- Use of Avertin in Elderly Urologic Patients. R. C. Romig and C. D. Donahue, Eugene, Ore.—p. 37.  
Diagnosis and Treatment of Neurosyphilis. A. L. Sahs, Iowa City.—p. 41.  
Internal Hydrocephalus Due to Syringomyelialike Process of Aqueduct of Sylvius. V. D. Sneeden, Portland, Ore., and C. P. Larson, Tacoma, Wash.—p. 44.  
Paratyphoid Fever with Negative Bacterial Findings: Case Report. A. C. Reed, San Francisco.—p. 46.  
Surgical Responsibility in Tonsillectomy. L. W. Jordan, Portland, Ore.—p. 47.  
Surgical Management of Gallbladder Disease: Diagnosis and Treatment. M. A. Howard and J. M. Guiss, Portland, Ore.—p. 50.  
Treatment of Congestive Heart Failure. A. G. Friend, Seattle.—p. 53.  
Vitamin B<sub>1</sub> for Acute Heart Failure: Case of a 2½ Year Old Girl. O. J. Morehead, Ritzville, Wash.—p. 57.  
\*Anemia in College Women. Helen B. Pryor and Mary Ferguson, Stanford University, Calif.—p. 58.  
Clinical Diagnosis Confirmed. K. Winslow, Seattle.—p. 60.

**Anemia in College Women.**—Through blood studies of 364 college women with complaints and symptoms of anemia, Pryor and Ferguson find that achromic anemia is just as frequent as secondary anemia among women of the college age level. There were 145 instances of hemoglobin below 70 per cent which, according to Greene, is low enough to be classified as chlorosis. However, erythrocyte counts were relatively high, resulting in low color indexes in only 11 of the cases. The lowest hemoglobin was 42 per cent with an erythrocyte count of 3,920,000, producing a color index of 0.53, and is consistent with the diagnosis of chlorosis. A diagnostic point consistent with the classification of chlorosis and chlorotic anemia is the remarkable response of these students to simple treatment with iron tonics. The symptoms and complaints of these girls are no doubt traceable to loss in oxygen-combining and oxygen-carrying properties of the erythrocyte. The degree of impairment of normal body functions is probably the direct result of interference with cell nutrition and function. Dysmenorrhea is occasionally caused by anemia, when the erythrocytes fail to carry sufficient oxygen. When anemia is severe or of long duration the myocardium may be involved, and dysmenorrhea then develops as a result of myocardial weakness. The authors did not observe this type of dysmenorrhea among the 364 college women, but it is possible that the palpitation, syncope, low blood pressure and dizziness complained of by these patients could be explained on this basis. More than half of the girls in the series who had chlorosis, chlorotic anemia or achromic anemia complained of dysmenorrhea in some form, menorrhagia, metrorrhagia or deficiency or irregularity of flow. Dysmenorrhea was the most frequent complaint (54 per cent). The high frequency of menstrual disturbances among girls with the achromic anemias is consistent with the known age incidence (from 14 to 25 years) of chlorosis and appears to bear a definite relation to the establishment of catamenia. Since this type of anemia appears during adolescence it is thought to represent an endocrine imbalance during the time of sexual development. A study of body proportion or body build shows that 91 of the 145 girls were of slender build with width-length indexes more than one standard deviation below the mean for their ages. Linear type girls mature sexually at a later age than the lateral type and they have lower blood pressures, poorer musculature, more fatigability and are more highly strung and nervous. This appears to make the linear type of girl particularly predisposed to the symptoms and complaints of achromic anemias. Certain constitutional inadequacies evidently play a part in the development of these anemias.

# Ohio State Medical Journal, Columbus

37:209-304 (March) 1941

- Management of Fits in Adults. C. D. Aring, Cincinnati.—p. 225.  
Report on Eleven Years' Experience in Treatment of Varicoseities and Sequelae of Lower Extremities. G. B. Watson, Columbus.—p. 231.  
Urology in War. V. C. Laughlin, Cleveland.—p. 235.  
Radiation Castration as Auxiliary Treatment to Mammary Cancer: Report of Case of Recastration. S. W. Donaldson and I. Silverman, Ann Arbor, Mich.—p. 238.  
What Is Your Type of Cold? T. M. Stewart, Cincinnati.—p. 242.  
Hematomyelia. W. Ravine, Cincinnati.—p. 245.  
Observations on Application of Vitamin D to Skin. E. A. Wagner and D. V. Jones, Cincinnati.—p. 249.  
New Method for Removal of Powder Tattoo: Report of Case. H. B. Kaufman, Philo.—p. 254.  
Reticulated Tuberculosis Primary in Abdomen: Case Record Presenting Clinical Problems. H. S. Reichle, Cleveland.—p. 255.

# Pennsylvania Medical Journal, Harrisburg

44:673-800 (March) 1941

- \*Management of Hyperthyroidism Complicated by Other Conditions. R. B. Cattell, Boston.—p. 685.  
Organized Medicine in a Community Health Program. F. F. Borzell, Philadelphia.—p. 693.  
Demonstration of Tumors, Nonneoplastic Disease and Foreign Bodies in Neck and Chest by Body Section Roentgenography (Planigraphy). B. R. Young, Philadelphia.—p. 713.  
Stillbirth: Clinical and Investigational Study: Preliminary Report. J. A. Hepp, Pittsburgh.—p. 718.  
Symptomatology of Diabetes. J. H. Barach, Pittsburgh.—p. 722.  
Diabetic Coma (Ketosis). G. G. Duncan, Philadelphia.—p. 725.  
Treatment of Trigeminal Neuralgia. S. N. Rowe, Pittsburgh.—p. 728.  
Acute Cholecystitis: Summary of Experience in the Past Ten Years with Comparison and Discussion of Results by Immediate, Early and Late Operation. J. L. Atlee and J. L. Atlee Jr., Lancaster.—p. 731.  
Homogenized Milk: New Development in Adaptation of Cow's Milk for Infant Feeding. I. J. Wolman, Philadelphia.—p. 735.

**Management of Complicated Hyperthyroidism.**—Cattell states that, up to September 1940, 19,500 operations for goiter were performed at the Lahey Clinic. Of these approximately one half were for exophthalmic goiter. An additional 20 per cent had hyperthyroidism associated with preexisting goiter. In approximately 12 per cent of all toxic cases hyperthyroidism was complicated by other conditions. In one series of 7,363 patients with hyperthyroidism 424, or 5.8 per cent, had auricular fibrillation. Approximately 10 per cent have auricular fibrillation postoperatively. The preoperative treatment of such patients is directed toward the relief of decompensation, and at the same time the routine preparation (rest, compound solution of iodine, sedatives and a high caloric diet) is continued. Patients with decompensation and those with established auricular fibrillation or flutter are digitalized preoperatively and a maintenance dose is continued during the postoperative period. If digitalization does not cause the edema to disappear, diuretics are used. From two to three weeks is required to prepare such patients for operation and many may require stage operations. Immediately after operation all thyrocardiac patients are placed in oxygen tents for a minimum of forty-eight hours or until normal rhythm is restored. When the diagnosis of hyperthyroidism and concomitant pulmonary tuberculosis is made the thyroid condition should be treated first. A preoperative hospitalization of three weeks with the usual thyroid measures is indicated. Subtotal thyroidectomy can usually be done in one stage unless the hyperthyroidism is so severe that grade operation is indicated. The usual treatment of the tuberculous patient suffices to give the best convalescent care in the postoperative thyroid case. Diabetes and hyperthyroidism occur in 1.5 per cent of toxic thyroid patients. Any patient with diabetes who has an enlarged thyroid should be considered as one having possible hyperthyroidism. If hyperthyroidism is reasonably apparent, operation is indicated. Stage operations may be necessary for many of these patients. Patients with hyperthyroidism and diabetes who have had a subtotal thyroidectomy show improvement in the diabetic condition. Hyperthyroidism aggravates the diabetic condition, while subtotal thyroidectomy results in increase of carbohydrate tolerance and a decreased demand for insulin. Jaundice is present in approximately 0.5 per cent of toxic thyroid patients. Its presence usually indicates a crisis or an impending crisis. If the jaundice is due to disease of the biliary tract, its treatment is delayed until the hyperthyroidism has been relieved. If pernicious anemia with cardiac decompensation is the complication, it should be treated first and the iodine administration continued. In less severe cases a partial remission of the hyperthyroidism by medical means should be attempted while active treatment of the anemia is continued. If myasthenia gravis is the complicating illness, prolonged treatment with ephedrine and aminoacetic acid is indicated before thyroidectomy is considered. If there is any postoperative evidence of respiratory obstruction, tracheotomy should be done at once. The added risk is justified as the hyperthyroidism tends to aggravate the muscular weakness. Cancer of the thyroid in hyperthyroidism is a coincidental finding. Approximately 8 per cent of patients with true exophthalmic goiter or primary hyperthyroidism have a discrete fetal thyroid adenoma. Such an adenoma unquestionably is the seat of the malignant change in the rare cases in which it is encountered. When such a condition is present and is localized, total hemithyroidectomy is performed, with a subtotal hemithyroid-

ectomy of the opposite side. In the more extensive cases as complete a thyroidectomy as is practicable is carried out. In hyperthyroidism complicated by pregnancy, operation (subtotal thyroidectomy) is advised and carried out up to and including the eighth month. In patients with mild, diffuse infection of the upper part of the respiratory tract, operation is delayed until the infection has subsided. Focal infection should not be treated before the hyperthyroidism is relieved. Other operations for complicating gynecologic disorders should be planned for from three to six months after subtotal thyroidectomy. Operations for cancer of the stomach and colon in typical hyperthyroid patients can be performed from ten to fourteen days after thyroidectomy.

### Rhode Island Medical Journal, Providence

24:37-56 (March) 1941

- Nutritional Aspects of Pregnancy. A. L. Potter, Providence.—p. 37.  
Erysipeloid: Report of Case Treated with X-Ray and Sulfanilamide. A. W. Eckstein, Providence.—p. 41.

### Rocky Mountain Medical Journal, Denver

38:169-256 (March) 1941

- Clinical Gout. J. H. Talbott, Boston.—p. 186.  
Surgical Significance of Gastrointestinal Bleeding. V. C. Hunt, Los Angeles.—p. 196.  
Congenital Atresia of Esophagus with Tracheoesophageal Fistula: Three Case Reports and Discussion of Condition. C. B. Freudenberg and J. P. Kerby, Salt Lake City.—p. 202.  
Physical Abnormalities Found in College Students. L. W. Bortree, Colorado Springs.—p. 206.  
Treatment of Recent Colles Fractures. S. P. Newman, Denver.—p. 211.  
Abductor Paralysis Following Thyroidectomy. T. E. Beyer, Denver.—p. 214.

### South Carolina Medical Assn. Journal, Greenville

37:45-74 (March) 1941

- Consideration of Suture Material. W. H. Pridelau, Charleston.—p. 45.  
Acute Infectious Mononucleosis. O. B. Mayer, Columbia.—p. 48.  
Sketch of the Life of J. L. E. W. Shecut. R. Wilson, Charleston.—p. 52.

### Southern Medical Journal, Birmingham, Ala.

34:239-342 (March) 1941. Partial Index

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Treatment of Cancer of Larynx. C. L. Jackson, Philadelphia.—p. 243.  
Epithelial Plaques of Conjunctiva. J. W. Jervey Jr., Greenville, S. C.—p. 255.  
Experiences with Hydrophil Bases and Sulfonated Products. E. D. French, Miami, Fla.—p. 284.  
Effect of Female Sex Hormones on Infection and Inflammations. D. H. Sprunt, Durham, N. C.—p. 288.  
Effect of Vitamins on Infection and Inflammation. E. W. Patton, Nashville, Tenn.—p. 289.  
Relation of Capillary Permeability to Inflammation. R. H. Rigdon, Memphis, Tenn.—p. 292.  
Mental Symptoms in Frontal Lobe Tumors, with Special Reference to Role of Psychiatrist in Diagnosis. G. C. Anderson, New Orleans.—p. 302.  
Ophthalmologic Considerations in Neurosurgical Cases. Kate Savage Zerfoss, Nashville, Tenn.—p. 307.  
Importance of Primary Care in Treatment of Compound Fractures. H. W. Orr, Lincoln, Neb.—p. 315.  
Comparative Study of Treatment of Compound Fractures. Ruth Jackson, Dallas, Texas.—p. 319.  
Role of Deep X-Ray Therapy in Pruritus Vulvae. W. E. Eastland, Oklahoma City.—p. 324.  
Sarcoma of Uterus. W. Searight, Memphis, Tenn.—p. 326.  
Use of Erythrol Tetramitate as Diuretic. W. M. Nicholson and V. E. Moseley, Durham, N. C.—p. 331.

### Southern Surgeon, Atlanta, Ga.

10:153-224 (March) 1941

- Surgical Correction of Oligomenorrhea, Menorrhagia and Menopause by Ovarian Isoplastism. M. J. Bennett, Philadelphia, and P. B. Russell Jr., Memphis, Tenn.—p. 154.  
Hormones Interpreted Quantitatively: Cyclic Variations of Some. M. J. Bennett, Philadelphia; P. B. Russell Jr., Memphis, Tenn., and L. C. Ramsey, Philadelphia.—p. 164.  
Observations on Malignancies of Large Bowel. I. Cohn, New Orleans.—p. 173.  
Fractures of Jaws. W. G. Hamm, Atlanta, Ga.—p. 185.  
Regional Ileitis. H. E. White, St. Augustine, Fla.—p. 194.  
Midline Aberrant Thyroid: Report of Case. J. G. Gay, Atlanta, Ga.—p. 199.  
Gynecologic Problems of Elderly Women. W. N. Jones, Birmingham, Ala.—p. 203.  
Torsion of Omentum. J. D. Martin Jr., Atlanta, Ga.—p. 210.  
Relation of Allergy to Surgical Diagnosis in Diseases of Gastrointestinal Tract. A. E. Cohen, Louisville, Ky.—p. 216.

### Surgery, Gynecology and Obstetrics, Chicago

72:257-550 (Feb. 15) 1941

- Aseptic Resections in Gastrointestinal Tract, with Special Reference to Resection of Stomach and Colon. O. H. Wangenstein, Minneapolis.—p. 257.  
Surgical Treatment of Gastrojejunocolic Fistula. D. B. Pfeiffer, Philadelphia.—p. 282.  
Surgical Treatment of Achalasia of Esophagus. A. Ochsner and M. DeBakey, New Orleans.—p. 290.  
Some Factors Influencing Curability of Cancer of Stomach. T. F. Mullen, San Francisco.—p. 298.  
Sulfonamide Therapy as Aid to Surgery. J. S. Lockwood, Philadelphia.—p. 307.  
Recent Progress in Surgical Treatment of Carcinoma of Esophagus. W. E. Adams, Chicago.—p. 312.  
Treatment of Traumas of Skin and Subcutaneous Tissues. F. W. Bancroft, New York.—p. 318.  
Management of Urinary Bladder in Traumatic Lesions of Spinal Cord and Cauda Equina. R. M. Nesbit and W. G. Gordon, Ann Arbor, Mich.—p. 328.  
Principles of Surgery of Colon. F. W. Raukin, Lexington, Ky.—p. 332.  
\*Heparin in Thrombosis and Blood Vessel Surgery. G. Murray, Toronto.—p. 340.  
\*Present Status of Carcinogens and Hormones in Cancer Research. J. J. Morton, Rochester, N. Y.—p. 345.  
Neurogenic Sarcoma. D. V. Trueblood, Seattle.—p. 363.  
Radiation Damage to Tissue and Its Repair. E. M. Daland, Boston.—p. 372.  
\*Present Status of Treatment of Gynecologic Cancer, with Special Reference to Results Obtained Since Introduction of Supervoltage Roentgen Therapy—Statistical Analysis of Results from 1922 to 1935. G. Kamperman, Detroit.—p. 384.

**Heparin in Thrombosis and Blood Vessel Surgery.**—Murray and his associates have given a purified nontoxic preparation of heparin to about 700 patients in sufficient doses to raise the clotting time to two or three times the normal level. Except for a few months in 1939, when thermal reactions occurred in about 50 per cent of their patients, there have been no toxic effects. The patients experience no more effect than that of an ordinary intravenous saline solution. The chief disadvantage of its use is that it is necessary for the patient to be in bed to receive the continuous intravenous injection. Intermittent injections two or three times a day to make the effect of heparin last a few hours are impracticable because so much must be given that the clotting time is elevated to several hours, which, of course, is undesirable and might be dangerous. There are no contraindications to the use of heparin except for patients with active bleeding from an open vessel, when the prolonged clotting time will encourage bleeding. Its administration is specifically indicated if the operation has involved a direct attack on blood vessels or when suture, repair or grafting of a blood vessel is necessary. The author has used heparin with satisfactory results in the following types of cases: arterial suture, arteriovenous fistula, venous grafts, embolectomy, mesenteric thrombosis, thrombophlebitis, phlebothrombosis and pulmonary embolism. Many of the operations might be performed with successful results without heparin, but with its use success is assured and the results have been most satisfactory. In thrombophlebitis, phlebothrombosis and pulmonary embolism there is less residual edema of the legs when the patient has been treated with heparin than when treated by other methods. When pulmonary embolism has occurred and the patient has survived long enough for heparin to be administered intravenously there has been striking clinical improvement. In 44 patients in whom no further embolisms occurred, rapid clinical improvement ensued. In 2 other patients further small embolisms may have occurred. This was not proved and the 2 patients recovered.

**Carcinogens and Hormones in Cancer Research.**—Morton reviews recent developments in the field of the carcinogenic agents, including the hormones, chemical carcinogens and light effects. There is no evidence that a definite chemical structure is necessary for carcinogenic activity. The chemicals vary from simple acids and alkalis, metal salts, radioactive compounds and sugars to complicated dyes, hydrocarbons, estrogens and viruses (heavy proteins). The "maximal effective" or "limiting dosage" indicates the quantity of the carcinogenic agent to which tissues respond. The limiting dosage varies from species to species. There is an intrinsic hereditary factor for cancer susceptibility or resistance. This factor may not necessarily be genic but at times extrachromosomal as well.

Animals of pure strain make for better controlled observations. Sex, season and the vehicle solvent should be considered. The carcinogens may unmask the latent spontaneous potentialities of the strain. Certain chemical carcinogens seem to have selective action on certain tissues. Epithelial growths, sarcomas and visceral carcinomas can now be induced by chemical means. Different species have tendencies toward different types of tumors. Each species and strain has its own characteristic tumor rate, organ susceptibility and latent period. The carcinogenic chemicals have a toxic action; locally they damage the tissues, inhibit growth. The damaged tissues may release substances which modify the neighboring cells, cause some hemolysis, have a photodynamic action and undergo metabolic changes in the body. In attempting to detoxify these chemical agents the essential sulfur containing amino acids may be used up. Some carcinogens are changed in the liver and intestine, giving fluorescence spectrums different from the originals. General systemic effects in the blood, lymphoid apparatus, vascular system and kidneys follow their application. The process may be considered as physiologic aging. The hormones are natural potential carcinogens. Under normal circumstances their functions are physiologic regulation. In repeated forced action they may become potent carcinogens. Many hormones are synergistic with or antagonistic to other hormones. Accentuation of their normal action or removal of the organ responsible for them may cause hypertrophy or atrophy of certain organs. Cancers may be induced in the overdeveloped organs or prevented by the absence of the organ. The process of cancerization still remains a mystery in its final steps.

**Treatment of Gynecologic Cancer.**—Kamperman discusses, on the basis of five and ten year cures, the 845 gynecologic cancers treated at Harper Hospital from 1922 to 1935 inclusive. He considers the more salient points of routine clinical procedures that have led to present day treatment. Since 1933 patients with gynecologic cancer have been irradiated with from 500 to 600 kilovolts more or less routinely. An evaluation of this change on the five year results is possible for three years. The 845 gynecologic cancers represent 636 carcinomas of the cervix uteri, 77 carcinomas of the fundus uteri, 171 carcinomas of the ovary and 31 carcinomas of the external genitalia. In tabulating the five and ten year results, patients who died from causes other than cancer were assumed to have died from cancer and the 2 per cent of untraced cases were likewise included among the dead from cancer. Thus the survival curves represent the lowest possible figures. In the earlier cases of carcinoma of the cervix, panhysterectomy and the Wertheim operation were occasionally performed, in conjunction with which high voltage roentgen therapy was always administered. Because of the apparent favorable results obtained from radium in some advanced cases its use gradually replaced surgical operations even in early cases. For carcinoma of the uterine fundus the earlier cases were considered adequately treated when a wide panhysterectomy was performed. Later both surgery and radiation were employed. During the course of time all surgical procedures, because of the addition of irradiation, were reduced to more conservative interventions. The irradiation technic consisted in the combination of intracavitary radium and external roentgen therapy whenever possible. From 1922 to 1928 the radium dose varied from 1,200 to 2,400 for a single to from 3,600 to 5,000 milligram hours for a total application. Since 1928 it has consisted of from 3,600 to 5,000 for a single to from 7,200 to 10,000 milligram hours for a total application. Apart from minor details from 1922 to 1932 the so-called high voltage roentgen therapy with 200 kilovolts (1 mm. of copper filter) was used, and since 1933 supervoltage roentgen therapy with from 500 to 600 kilovolts (7 millimeters of copper filter) has been substituted for most gynecologic cancers. For carcinoma of the cervix uteri the five and ten year survivals between 1922 and 1928 averaged 16 and 12 per cent, respectively; from 1928 to 1932 they were respectively 21 and 15 per cent, and since 1933 the five year survivals have reached 35 per cent. For carcinoma of the fundus uteri the average five year survivals have been raised from about 30 per cent prior to 1930 to 45 per cent after that year and to nearly 50 per cent after 1933. The ten year results run a close parallel to

the five year results. The results for cases in which panhysterectomy was performed as soon as the diagnosis was established and radiation therapy was administered after operation and respectively for those in which a full course of intracavitary radium and external roentgen therapy was given first and operation performed after the subsidence of the biologic irradiation effect and further irradiation was given in the postoperative period were for five year survivals 55 per cent with the first and 71 per cent with the second type of treatment. In most cases of ovarian cancer a combination of surgery and irradiation was necessary at one time or another. Whenever a patient constituted a good operative risk the large neoplastic masses were excised and irradiated. In other instances preliminary radiation therapy was given and operation was reserved until the biologic radiation reaction cleared up. In still other instances the operative procedure and the irradiation were repeated or even alternated many times for several years, depending on the clinical course. The five and ten year survivals represented broadly 20 and 18 per cent, respectively, throughout the entire period. The addition of supervoltage roentgen therapy, contrary to expectations, did not seem to influence the survival curves. This might be changed considerably with a larger series. For the 31 carcinomas of the external genitalia a combination of individualized surgery and radiation therapy was used in most cases. The five year survivals amounted to 29 per cent for the 14 cases of cancer of the labia, 10 per cent for the 10 of the vulva, and none for the 7 of the vagina. The number of cases treated with supervoltage roentgen therapy was too small to permit any estimation.

### West Virginia Medical Journal, Charleston

37:97-144 (March) 1941

- \*Bilateral Pneumothorax: Review of Fifty-Six Cases. R. M. Sonneborn, Wheeling.—p. 97.  
Thymic Malignancy. J. L. Wade, Parkersburg, and A. R. K. Matthews, Rockford, Ill.—p. 107.  
Plans for Handling Tuberculosis in the Virginias. E. C. Harper, Richmond, Va.—p. 113.  
Appendical Abscess: Method of Treatment. W. H. Pennington, Lexington, Ky.—p. 117.  
Avulsion of Scapula and Right Upper Extremity with Recovery. E. B. Henson, Charleston.—p. 120.  
School Health Problems. R. C. Hood, Washington, D. C.—p. 122.  
Metastatic Malignant Neoplasm of External Auditory Canal and Middle Ear: Report of Case. H. R. Johnson, Fairmont.—p. 128.  
Gonorrheal Ophthalmia in Premature Infant Treated with Sulfathiazole: Case Report. J. L. Blanton, Fairmont.—p. 130.

**Bilateral Pneumothorax.**—On the basis of data in 56 cases of bilateral pneumothorax performed at Hopemont Sanitarium, Sonneborn presents conclusions which he feels can serve as a working pattern when modified to meet the individual case: Bilateral pneumothorax is of definite value in the treatment of bilateral pulmonary tuberculosis, especially when the involvement is either moderately advanced in each lung or when it is far advanced in each lung, or far advanced in one lung and moderately advanced in the other. The series of cases presented is made up largely of the latter group. The successful results vary in inverse proportion to the extent of the disease. A period of bed rest should precede attempted collapse of those patients whose general condition is extremely poor. Collapse therapy is an adjunct to rest, and all patients should receive bed rest for twenty-four hours a day for from three to six months after the disease is apparently controlled or regressive. Whenever possible collapse procedures should be concentrated on controlling the disease in the first lung before contralateral pneumothorax is instituted, when the prognosis is much more favorable. Phrenic crush and pneumonolysis should be added whenever indicated. Frequently pneumothorax, even if not successful, may result in sufficient improvement to allow further therapy after the lung has reexpanded. Complications are twice as frequent in bilateral as in unilateral pneumothorax. Of 56 patients the disease of 19 is inactive, 2 have an active bronchitis with positive sputum but an apparently controlled parenchymal lesion, the disease of 6 has become inactive with additional procedures after reexpansion of the uncontrolled but improved lung, 13 are known to be dead and the disease of 16 is active. The disease of 4 of these 16 patients is controlled on one side with pneumothorax, and further therapy may be possible on the contralateral lung at some future date.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Journal of Children's Diseases, London

37:217-286 (Oct.-Dec.) 1940

Acute Poliomyelitis. W. H. Kelleher.—p. 217.

\*Acute Endocarditis in Infants. S. Wolff.—p. 241.

**Acute Endocarditis in Infants.**—Wolff cites 2 cases of acute endocarditis in infants with recovery. He believes that the number of cases of endocarditis in infants diagnosed during life and not on the postmortem table would increase considerably if physicians kept firmly in mind the triad of symptoms described by Finkelstein: pallor of face, attacks of cyanosis and accelerated respiration. An early diagnosis would probably also increase the number of cured cases. Endocarditis in infants is due chiefly to influenza or sepsis. The 2 instances reported originated from apparently harmless boils and both were due to staphylococci. The sepsis or pyemia was, in the first case, proved by the secondary focus in the parotid, in the second case by the blood culture and giant spleen, which extended to the nipple line. During recovery the spleen became continually smaller until at last it was hardly palpable. The blood culture also became negative. In contrast to the statements of Orgler and others the loud systolic murmur, as a symptom of endocarditis, could be heard from the very beginning and remained as a sign of the defect resulting from the endocarditis. The friction sound in the second case, which was due to the complicating pericarditis, disappeared after recovery. The essential point in treatment is the removal of pus from accessible places—from the boil and pericardium in the cases cited. Sulfanilamide, a specific against streptococci, had no effect, whereas blood transfusion, the highly concentrated calcium Sandoz and redoxon forte (a proprietary ascorbic acid) decidedly influenced the healing process. However, the final change was evidently due to antistaphylococcus serum. That the heart withstood the disease is certainly a result of immediate and considerable digitalization, which even caused rhythmic disturbances because of overdosage. The theoretical objections against digitalis in septic endocarditis have been disproved by Schottmüller and by Fraenkel. The greatest attention should be paid to even small boils in infants, as their early evacuation might prevent this serious disease.

## British Medical Journal, London

1:183-226 (Feb. 8) 1941

Gee-Thaysen Disease (Idiopathic Steatorrhea of Adults and Adolescents in Nontropical Countries). J. F. O'Sullivan, with note and postscript by H. Moore.—p. 183.

\*Blood and Plasma Transfusion in Alimentary Hemorrhage. D. A. K. Black and A. F. Smith.—p. 187.

Amputations in Bed. H. A. Brittain.—p. 192.

Double Infection of Meninges with Meningococcus and Gaertner's Bacillus. K. J. Guthrie and T. Anderson.—p. 193.

Comparison of Results of Surgery and Radiotherapy in Carcinoma of Cervix Uteri. W. R. Winterton and B. W. Windeyer.—p. 195.

**Blood and Plasma Transfusion in Alimentary Hemorrhage.**—Black and Smith compare the effects of citrated whole blood with those of plasma for massive bleeding from the stomach or duodenum. The 9 patients studied were bleeding severely from the stomach or duodenum; the first 3 were given massive transfusions of citrated blood by slow drip, 1 reconstituted dried serum in fourfold strength, 2 plasma infusion supplemented immediately by blood transfusion and 3 plasma alone by slow drip. One of the latter patients required whole blood five days later. In the 6 patients given plasma immediate subjective or objective clinical improvement was absent; all showed some harmful effect, and in 2 of them the reaction was so severe that massive blood transfusion had to be used at once. The chief complaints during plasma infusion were headache, faintness and a vague sense of irritability. Objectively, increase in pallor, quickening pulse and drowsiness, leading to actual unconsciousness, were observed. In 1 patient, who had a low hemoglobin at the outset, unconsciousness persisted for more than half an hour. Even after the patients recovered from the immediate effects of plasma transfusion, clinical improvement, and especially blood regeneration, were notably slower than in the patients given whole blood. The patient who was given serum, and whose plasma volume

increased only by 300 cc., was an exception to this. On the whole plasma compared unfavorably with whole blood in its effects on the blood volume and hemoglobin concentration. It did not lower the degree of azotemia to the same extent as whole blood. It is suggested that the ill effects of plasma in these cases are due to forced dilution of the blood in excess of the limits favorable to recovery from hemorrhage. Generally plasma is contraindicated when the hemoglobin is less than 50 per cent.

1:227-262 (Feb. 15) 1941

Effect of Peritoneal Irritation on Activity of Intestine. D. M. Douglas and F. C. Mann.—p. 227.

Treatment of Open Wounds by Sulfanilamide Pack. A. C. King.—p. 231.

Paresis Following Herpes Zoster: Report of Two Cases. A. B. Carter and J. B. W. Dunlop.—p. 234.

Bell's Palsy and Herpes Zoster. J. D. Spillane.—p. 236.

\*Outbreak of Trichiniasis in Wolverhampton and District: Clinical Account of Seven Cases. J. E. S. Lee.—p. 237.

Trichiniasis in Hertfordshire. L. P. Garrod and D. Maclean.—p. 240.

**Outbreak of Trichiniasis.**—Lee cites 7 unusual cases of trichiniasis which presented atypical features. Nephritis, pneumonia, renal damage, influenza, pyrexia of unknown origin, suspected typhoid and pyelitis were the conclusions arrived at before the patients were admitted to the New Cross Hospital. The predominating signs and symptoms consisted of edema of the eyelids (the outstanding symptom in all the patients), headaches, nailbed and conjunctival hemorrhage or injection, mental torpor with lethargy, drowsiness, confusion and slowed cerebration, heaviness in the limbs, generalized aches and pains, muscular tenderness and stiffness, disturbed reflexes, paralysis and severe constipation. Two patients vomited and 1 had colic. Sheldon, a consulting physician, put forward a tentative diagnosis of trichiniasis. The fact that many of the typical symptoms of such a diagnosis were not shown by the 7 patients threw doubt on the diagnosis. However, biopsy of the pectoral muscle was performed and the diagnosis was established by the identification of *Trichinella spiralis* embryos. There was little or no capsule formation, and the opinion was that the parasite had just reached the muscle. Further confirmation was obtained when another successful biopsy was performed. The 7 patients were all admitted to the hospital within five weeks. The author suggests that the abnormal mental state appears to have been inadequately described in the past and is worthy of special note. Hemorrhages into the conjunctivas and nailbeds appear to be attributable to larval embolism. Involvement of the central nervous system was also possibly of embolic origin. The constipation was exceedingly troublesome and resulted in fecal impaction on one occasion.

## Lancet, London

1:203-234 (Feb. 15) 1941

Outbreak of Trichiniasis in Wolverhampton and District. J. H. Sheldon.—p. 203.

New Concept of Toxemia of Diphtheria. R. A. Q. O'Meara.—p. 205.

Treatment of Hypertoxic Diphtheria with Avid Serum. C. J. McSweeney.—p. 208.

\*Fluorine in Etiology of Endemic Goiter. Dagmar Curjel Wilson.—p. 211.

Bronchitis and the Bronchial Tree. S. Engel and G. H. Newns.—p. 212.

**Fluorine in Etiology of Endemic Goiter.**—According to Wilson, the distribution of endemic goiter in the Punjab and in England is related to the geologic distribution of fluorine and to the distribution of human dental fluorosis (mottled enamel). Inquiry showed the presence of dental fluorosis among school children in two areas of Somerset, where two previous observers had recorded a high incidence of goiter, and the absence of dental fluorosis in an adjoining area selected as control where endemic goiter was absent. Of 378 children examined in the area mapped as endemic for goiter, 55 showed some degree of dental fluorosis, while of 103 children examined in the control area, none were affected. The author does not suggest that the presence of fluorine in drinking water is the only factor in the causation of endemic goiter in the particular regions; the intervention of other factors operating against the production of goiter may completely overcome the action of fluorine in promoting it. For instance a weekly call by a fishmonger's van at an isolated village in the coastal areas of Essex with a high degree of human dental fluorosis has been described to counteract the effects of a local deficiency of iodine.

**Schweizerische medizinische Wochenschrift, Basel**

70:1237-1260 (Dec. 21) 1940

Lethal Hereditary Factors. E. Hadorn.—p. 1237.

\*Constitutional Congenital Lack of Fibrinogen and Fibrinopenia During Childhood. E. Glanzmann, H. Steiner and H. Keller.—p. 1243.

Therapy of Tuberculous Eye Diseases in Zurich Eye Clinic: Importance of Continuous Quartz Lamp Irradiation of Entire Body and Fasting Cures. Laura Seiler.—p. 1246.

New Methods of Transportation of Wounded in High Mountains. H. Gut.—p. 1249.

70:1261-1284 (Dec. 28) 1940

\*Constitutional Congenital Lack of Fibrinogen and Fibrinopenia During Childhood. E. Glanzmann, H. Steiner and H. Keller.—p. 1261.

Tracheobronchiectasis and Remarks on Estimation of Bronchiectasis. M. Kartagener and K. Ulrich.—p. 1266.

Aspects of Intestinal Knots. T. Johner.—p. 1270.

Metamorphosis of Leukocytes in Urine. V. Goldberg.—p. 1272.

Observations Made on Cerebral Cortex by New Procedure of Impregnation. E. Landau.—p. 1273.

**Congenital Lack of Fibrinogen and Fibrinopenia.**

According to Glanzmann and his associates, cases of hemorrhagic diathesis as the result of fibrinogen deficiency are comparatively rare in children. These cases can be classified into two groups: (1) the cases of congenital lack of fibrinogen (afibrinogenemia) and (2) the cases of fibrinopenia, which can be subdivided into hereditary fibrinopenia and acquired fibrinopenia. The authors describe in detail an instance of constitutional congenital lack of fibrinogen in a boy aged 3. They designate permanent absence of fibrinogen, incoagulability of blood, prolonged bleeding time and intermittent thrombopenia as the essential characteristics of congenital lack of fibrinogen. The outcome of the Takata-Ara reaction and the Weltmann reaction does not indicate an impairment of the hepatic parenchyma. Hemorrhagic attacks may become fatal. The development of giant hematomas, the contents of which remain fluid, is especially characteristic of congenital absence of fibrinogen. The administration of a vitamin K preparation, the intravenous injection of 10 cc. of a 20 per cent calcium gluconate, of 5 cc. of a potent ascorbic acid preparation and the local application of stryphnon (a preparation of methylamino-aceto-orthodioxylbenzol) proved helpful in the arrest of hemorrhage. Hereditary fibrinopenia is transmitted to both sexes and usually is combined with thrombopenia; it is benign and the patients may reach an advanced age. The authors give a detailed description of a case of acquired fibrinopenia in an infant aged 8 months. The discussion of this case is followed by a comparison of congenital lack of fibrinogen and acquired fibrinopenia. The complete lack of fibrinogen is congenital, whereas fibrinopenia is acquired. In congenital absence of fibrinogen the fibrinogen is constantly lacking, the blood is noncoagulable, the bleeding time is prolonged and there is intermittent thrombopenia, whereas in acquired fibrinopenia fibrinogen is lacking only temporarily, the bleeding time is shortened, but intermittent thrombopenia exists here as in congenital lack of fibrinogen. The plasma protein picture is not greatly changed in the congenital lack of fibrinogen, but in the acquired fibrinopenia the globulin is increased. The Takata-Ara reaction is negative in the first condition but positive in the second. In congenital lack of fibrinogen there exist no signs of hepatic impairment, whereas fibrinopenia is accompanied by hepatosplenomegaly and jaundice. Whereas, in congenital lack of fibrinogen, large hematomas develop after traumas, fibrinopenia is accompanied by streaklike cutaneous hemorrhages. A vitamin K preparation seems an effective hemostatic in both conditions.

**Policlinico, Rome**

47:1931-1978 (Nov. 18) 1940. Prac. Sec. Partial Index

\*Acute Abdominal Syndrome from Empyema and Perforation of Lung. E. Ruggieri.—p. 1931.

**Abdominal Symptoms from Empyema and Perforation of Lung.**—Ruggieri reports 5 cases of acute abdominal symptoms simulating acute surgical conditions of the abdomen which resulted from acute purulent empyema in 3 cases, perforation of the collapsed lung in the course of artificial pneumothorax in 1 case and perforation of the lung into the mediastinum in another case. Purulent empyema was a complication of chronic or putrid pulmonary abscess. According to the author, when the abdominal symptoms are caused by empyema or perforation

of the lung a diagnosis can be made by an evaluation of the respiratory and abdominal symptoms. The respiratory signs on objective examination of the thorax and the roentgenograms may show the pleuropulmonary disease. In the absence of typical objective and roentgen signs, difficult and panting respiration, the given type of decubitus of the patient and the presence of cyanosis of the lips, on the one hand, and the subsidence of abdominal defense after prolonged palpation of the abdomen and absence of cutaneous hyperesthesia and of pain at the Douglas pouch during rectal examination on the other, are of diagnostic value. The abdominal symptoms due to empyema of the diaphragmatic pleura are characteristic of that location. The diagnosis of empyema following pneumothoracotomy for the treatment of purulent abscess is difficult. Egophony at the thoracotomy opening is a constant observation of diagnostic value. Dyspnea is the main symptom of spontaneous perforation of the lung whether or not complicating artificial pneumothorax. In rare cases it appears late. However, in cases of this type the nontypical symptoms of the abdomen indicate the delay of an abdominal operation, and the patient should be watched for the appearance of respiratory symptoms. When the condition develops in the course of artificial pneumothorax, the determination of the intrapleural pressure will clarify the diagnosis. In all cases the diagnosis is verified by the results of an exploratory puncture. The author believes that acute abdominal symptoms from pleuropulmonary diseases are due to acute disorders of the pulmonary circulation with consequent plethora of the splanchnic circulation.

**Terapia, Milan**

30:197-216 (Nov.) 1940

\*Action of Staphylococcus Toxoid on Infectious Bullous Dermatitis in Children. G. Roi.—p. 197.

**Action of Staphylococcus Toxoid in Bullous Dermatitis.**—Roi reports satisfactory results from staphylococcus toxoid in 19 cases of infectious bullous dermatitis which occurred in a crèche. The epidemic was caused by *Staphylococcus aureus*. The patients were all infants on artificial feeding and exhibiting nutritional deficiency, avitaminosis and slight rickets. The common treatment with pomades of bacterial filtrates, anti-staphylococcus vaccines and autovaccines failed. The staphylococcus toxoid treatment was preceded by a local treatment which consisted of rupturing the bullae, painting the lesions with a 0.5 per cent alcoholic solution of methyl green and gentian violet and applying antipyrogenic pomade. The toxoid was administered in intradermal injections, beginning with a 0.1 solution of pure toxoid in sodium chloride solution and increasing to 0.3 concentration and then to pure toxoid. The injections were administered in the supraspinous region every other day up to a total of from four to eight injections. The condition rapidly improved in all cases. The staphylococcus toxoid therapy appears to be of value in the treatment of bullous dermatitis of infants and is well tolerated. The toxoid acts by diminishing the allergy caused by the staphylococcus and by establishing antitoxic immunity and diminishing the virulence of the staphylococcus.

**Archivos Argentinos de Tisiologia, Buenos Aires**

16:299-436 (Oct.-Dec.) 1940. Partial Index

Addison's Disease from Metastatic Carcinoma of Adrenals Simulating Grave Tuberculosis. O. P. Aguilar and C. A. Bancalari.—p. 321.

\*Puncture and Aspiration of Tuberculous Cavities. A. A. Raimondi, M. M. Brea and J. A. Taiana.—p. 330.

**Puncture and Aspiration of Tuberculous Cavities.**—Raimondi and his collaborators performed intra-cavitary aspiration by Monaldi's technique in 6 cases of pulmonary tuberculosis with stationary cavities. Aspiration was discontinued in 4 cases and continued in 2. Cavernoscopy was performed in all cases. The cavity rapidly closed in 1 case. It remains healed up to one and one-half years after the operation, as shown by roentgenograms and the absence of clinical symptoms. In 1 case the cavity reappeared after temporary closure. In 1 case spontaneous pneumothorax and fatal bronchopneumonia followed. In 1 a phlegmon of the thoracic wall and hemoptysis appeared, and the disease entered an acute course. In 2 cases the disease entered an acute course after the operation from bilateralization



in 1 and cavernization of the base of the lung in the other. The authors point out that the operation is not harmless. It may cause propagation of tuberculosis, local unfavorable reactions, operative accidents (spontaneous pneumothorax) and phlegmon of the thoracic wall, any one of which has an unfavorable action on the disease. In some cases slight movements of the aspirating catheter cause coughing. The mechanism of action of intracavitary aspiration is not clear. In cases in identical circumstances, prolonged aspiration may fail in some whereas aspiration for a short time may be followed by permanent healing of the cavity in others. In general there are but few cavities which obtain benefit from aspiration. Since the results are inconstant, it is difficult to establish proper indications of the operation.

### Archiv für klinischen Chirurgie, Berlin

199:337-558 (Nov. 29) 1940. Partial Index

- \*Effect of Pregnancy and Postpartum Period on Growth of Malignant Tumors. Z. W. Mankin.—p. 337.  
Arterial Walls and Their Nutrition. C. I. Ghitzescu and J. Robacki.—p. 394.  
Treatment of Tetany, with Special Reference to Bone Implantation. P. C. Petropoulos and J. X. Müller.—p. 412.  
Acute Axillary Vein Congestion Due to Venous Wall Lesions. O. Henningsen.—p. 439.  
\*Primary Closure of Abdominal Cavity in Treatment of Acute Diffuse Peritonitis: Experimental Study. Y. Ishikawa.—p. 516.

**Effect of Pregnancy on Malignant Tumor.**—Mankin examined the controversial problem of the effect of pregnancy on existing malignant tumor on the basis of 72 cases observed in the Oncologic State Institute in Leningrad and of the extensive literature on the subject. Carcinoma of the breast (22 cases) and of the uterine cervix (22 cases) predominated. Sixty-five of the cases fell within the age level of 20 to 40 years. Pregnancy and the postpartum (or postabortum) condition evoked distinctly different reactions on tumor growth. Pregnancy did not stimulate existing malignant conditions but in many respects retarded proliferation. On the other hand, termination of pregnancy by birth or abortion significantly intensified the morbid processes and aggravated prognosis. Surgical intervention should therefore be primarily directed not to aborting the pregnancy but to the extirpation of the tumor. The etiology of these contrary reactions is to be sought in the mutual antagonism of the estrogens and luteins. During pregnancy, owing to the activity of the corpus luteum, luteins are abundant and hold the blastomogenic action of the estrogens in check. In the period after birth or abortion, with diminished activity of the corpus luteum and its derivative, the estrogens reassert their blastomogenic power. Prognosis in carcinoma of the uterine cervix was most favorable when tumor ablation and fetus removal were simultaneous or when the tumor was removed first. In fibroma of the abdominal wall, tumor extirpation is indicated as late as the sixth and seventh month of gestation. After that, surgical intervention is contraindicated because of the danger that the cicatrice left by the operation may be unable to develop sufficient resistance.

**Closure of Abdominal Cavity in Peritonitis.**—Ishikawa in his experimental study on 86 dogs, half of which served as controls, sought to determine the superiority of primary closure over drainage in acute diffuse peritonitis after operation. After the dogs, weighing from 10 to 14 Kg., had been paired off, a peritoneal lesion was artificially inflicted by injecting a freshly filtered fecal solution heated to normal temperature into the abdominal cavity (9 cc. per kilogram of body weight) without injuring the abdominal viscera. Laparotomy was performed in three stages, two, four and six hours after injection, and affected 13, 18 and 12 pairs of dogs, respectively. Dogs laparotomized after six hours died. The time limit of one hundred and twenty hours after injection was established as surviving time. Surviving animals were then killed. Survival rate, post-mortem observations, tests for the chloride content of the blood and for blood sugar and the erythrocyte count were all favorable to the closed method as against drainage. The mortality index for the closed method and the drainage groups were as follows: 23 per cent against 92.3 per cent laparotomized after two hours; 33½ per cent against 88.9 per cent after four hours; 66⅔ per cent against 100 per cent after six hours, an average of 40 per cent against 93 per cent. Of the third group, which

included 24 dogs, 4 dogs (none of them controls) were able to survive, though the reabsorption power of the peritoneum after six hours is greatly weakened. In no case did a control animal outlive its fellow. At necropsy, diffuse peritonitis was almost completely healed in the majority of the test dogs. In the controls, small pus formations were still found and, to a varying degree, inflammation of the mesentery, omentum, the intestinal serosa and the wall of the peritoneum persisted. The author states that the closed method has been used for years in his clinic with decidedly good results. Primary closure can be employed even in grave infections provided tamponade of purulent exudates is thorough and extensive.

### Beiträge zur Klinik der Tuberkulose, Berlin

95:335-414 (Nov. 22) 1940

- Intrapleural Pneumolysis (Three Hundred Cases of Pulmonary Tuberculosis Treated with Method of Jacobäus). K. Bönsdorff.—p. 335.  
\*White Blood Picture and Sedimentation Speed of Erythrocytes in Suction Drainage of Cavities. M. Flügge.—p. 367.  
Gastric Disturbances in Pulmonary Tuberculosis and Gastric Hemorrhages After Thoracoplasty. H. Hecht.—p. 377.  
Investigations on Pickof's Modification of Guinea Pig Experiment. I. Pegel.—p. 395.  
Experimental Investigations on Modification of Tuberculous Infection by Vapors of Aromatic Hydrocarbons. E. Rix and O. Schedtler.—p. 401.

**Blood Changes During Suction Drainage of Cavities.**—Flügge describes the behavior of the sedimentation speed of the erythrocytes and of the white blood picture in 19 cases of pulmonary tuberculosis in which suction drainage of the cavities was done. The blood picture was examined before the onset of suction drainage and at eight day intervals thereafter. The sedimentation speed was determined before the suction drainage and at four week intervals thereafter. Summarizing his observations, the author says that four phases can be differentiated in the blood of patients undergoing suction drainage. First there is the phase of the general reaction to the onset of the suction drainage; it is characterized by deviation to the left without lymphocytic crises and subsides at the latest after four weeks. The second phase is that during which sputum and drainage secretion become negative. Although the leukocyte count and the sedimentation values are increased, the noticeable lymphocytic reaction with changing number of staff-nuclear cells (depending on the severity of the secondary suppurating secretion) indicates the beginning of the curative phase. This phase persists as a rule until three months after the beginning of the suction drainage. In this phase the blood picture is a better indication of what is taking place than is the sedimentation reaction. The third phase, which is that of the cure of the cavity, extends to the withdrawal of the suction catheter. It is characterized by changing leukocyte counts and sedimentation values; the lymphocyte count is increased; the staff-nuclear count fluctuates, depending on the degree of suppurating secretion. In this phase again the sedimentation rate fails to indicate the degree of general improvement and cure. The fourth phase, which follows the treatment, is characterized by a normal leukocyte count and sedimentation value and by a persisting lymphocytic reaction without nuclear deviation.

### Deutsche Zeitschrift für Chirurgie, Berlin

254:213-288 (Nov. 18) 1940. Partial Index

- Renal Malformation in Form of Ren Elongatus Bipartitus. W. Siemens.—p. 213.  
\*Treatment of Postoperative Reactions in Patients with Exophthalmic Goiter. F. Kaspar.—p. 227.  
Surgical Treatment of Hypertension (Removal of Adrenals and Renal Decapsulation: Influence of Adrenal Cortex on Elimination of Water). T. Perras.—p. 234.  
Surgery of Sternum and Anterior Mediastinum. T. Perras.—p. 246.  
Wound Excision According to Friedrich and Customary Partial Wound Excision, Particularly in Cranial and Cerebral Injuries. H. Burckhardt.—p. 249.  
Completion of Bassini's Operation for Inguinal Hernias. G. Baggio.—p. 262.  
Extension of Operation Beyond Permission Granted by Patient. Schläger.—p. 272.

**Postoperative Reactions in Exophthalmic Goiter.**—Kaspar says that in the three years from 1937 to 1939 inclusive 4,384 struma operations were performed at his hospital, of which 287 concerned cases of exophthalmic goiter. Most of these patients were subjected to preoperative and postoperative iodine

medication, but some of them proved refractory to it. In 1 patient with exophthalmic goiter, in whom the postoperative reactions were extremely severe, the author gave an intravenous injection of 40 cc. of afenil and when this effected improvement he gave another intravenous injection of 20 cc. of afenil and administered 30 cc. of calcium gluconate intramuscularly. The favorable effect of this treatment induced the author to try large doses of calcium in other patients who reacted inadequately to iodine therapy and who had severe postoperative reactions. Later he administered large doses of calcium (from 20 to 30 cc. intramuscularly) also before the operation and he found it effective in other forms of hyperthyroidism, particularly in iodine thyrotoxicoses. The intramuscular injections of calcium are made with a long needle two or three fingerbreadths below the crest of the ilium, because in this manner the annoying infiltrations are avoided. The author recommends the administration of large doses of calcium (intravenously and intramuscularly) preoperatively as well as for the frequently severe postoperative reactions, reasoning that the calcium deficiency existing in exophthalmic goiter is at least partly responsible for the postoperative disturbances and that this deficiency is favorably influenced by the large doses of calcium.

### Medizinische Welt, Berlin

14:1137-1164 (Nov. 9) 1940. Partial Index

Toxic Dysentery (Experiences in Polish Campaign 1939). H. Krieger.—p. 1137.

\*Tuberculosis of Peritoneum. J. Petermann.—p. 1140.

Physiologic and Pathologic Cardiac Movements. H. Jaeger.—p. 1142.

Chronic Bronchitis and Prolonged Cough in Children. W. Walther.—p. 1145.

**Tuberculosis of Peritoneum.**—Petermann does not consider the tuberculous peritonitis that is a partial manifestation of an acute military tuberculosis and is fatal within a short time, but only those cases in which the tuberculous process of the peritoneum dominates the symptomatology. Tuberculous peritonitis is chiefly a disease of children. The mode of infection differs; the organisms may pass through the intestinal wall or may enter by way of the vagina and the tubes, leaving these organs themselves unimpaired. Dissemination following bursting of a tuberculous mesenteric lymph node is another possible mode of infection, but most frequent is the infection by way of the lymph channels. Hereditary predisposition is an endogenous etiologic factor. Exogenous etiologic factors are undernourishment and poor hygienic conditions. The early stage of the disease has only indefinite symptoms. The general condition is impaired, the appearance is poor and there are complaints of dyspeptic disturbances, of recurrent abdominal pains and frequently of diarrhea. Tuberculous peritonitis should be thought of, if these symptoms cannot be explained by helminthiasis or by disease of an abdominal organ. The second stage is characterized by the complete symptomatology and requires energetic treatment. During the third stage, complications develop which are decisive for the prognosis. Increase in the size of the abdomen is characteristic. The intestinal function is impaired. The author differentiates three forms of tuberculous peritonitis: the serous form with profuse exudation, the dry form with adhesions, indurations and nodular tumors, and finally the purulo-ulcerous or the caseous form, which leads to the formation of abscesses or perforations into the intestine. It is not always possible to differentiate these three forms strictly. Fresh air, sunshine and a rich diet are helpful in tuberculous peritonitis as in other forms of tuberculosis. Climatic therapy, particularly in the form of the high mountain climate, is also helpful. Surgical therapy, that is, laparotomy with evacuation of the exudate, has been employed with considerable success particularly in the exudative form. Extremely advanced tuberculous peritonitis and involvement of other organs are contraindications to laparotomy. The operation must be followed by energetic general treatment. Recurrent exudates can be counteracted by puncture, but early exudates should not be punctured because of their bactericidal effect. Insufflation of air or oxygen has been recommended following removal of the exudate. The author thinks that the efficacy of this measure is due to the hyperemia it induces and to the stimulation of the leukocytosis. He emphasizes that the

insufflation must be done with great caution. Tuberculin treatment can be employed as a supporting measure and demands strict individualization.

14:1165-1188 (Nov. 16) 1940. Partial Index

Estimation of Lesions of Knee Joint in the Army. A. Vogl.—p. 1165.

Acute Otitis Media. R. Perwitzschky.—p. 1167.

\*Whole Grain Bread, the Bread of the Future. W. Heupke.—p. 1172.

**Whole Grain Bread.**—Heupke stresses that in the average diet now available in Germany the supply of vitamin B<sub>1</sub> will be adequate only if a considerable portion of the bread consumed is of the whole grain type. Whereas 400 Gm. of rye whole grain bread contains 840 micrograms of vitamin B<sub>1</sub>, the more refined types of bread contain only from a sixth to a fourth of this amount. Moreover, it is known that the vitamin B<sub>1</sub> requirements are the greater the higher is the sugar and starch content of the diet. In view of the high carbohydrate content of the present day diet, the use of whole grain bread is a necessity in order to insure an adequate supply of vitamin B<sub>1</sub>. Vitamin B<sub>1</sub> is found exclusively in the grain germ and in the aleuron layer, that is, in those parts of the grain which are removed in milling the flour for the refined types of bread, whereas they remain in the flour used for the whole grain type of bread. The grain germ contains other valuable substances such as lactoflavin, vitamin A and vitamin E. Whole grain bread differs from refined bread also in protein, starch and mineral contents. The germ of the grain and the aleuron layer contain more valuable proteins than do the other parts of the grain, and for this reason the whole grain bread contains more valuable proteins than do the refined breads. Furthermore, the refined breads contain few minerals, because phosphoric acid, calcium, magnesium and iron are found chiefly in the external layers of the grain. Other valuable constituents of whole grain bread but not of refined bread are the auxins or growth substances. The greater nutritional value of whole grain bread has been proved by feeding experiments on animals. It has been proved that whole grain breads are valuable for the development and preservation of teeth and in the prevention of chronic constipation. The use of whole grain breads is now advocated in all civilized countries.

### Okayama Igakkai Zassi, Okayama

52:2783-2952 (Dec.) 1940. Partial Index

\*Two Cases of Pituitary Dwarfism. F. Hayasi.—p. 2899.

\*Studies in the Excretion of Bismuth. T. Seki.—p. 2925.

**Pituitary Dwarfism.**—Hayasi reports two cases of pituitary dwarfism (Erdheim) or nanosomia infantilis (Hanseman) in male subjects, both 19 years old, and one having physical measurements corresponding in normal subjects to those of 9 years and the other to those of 11 years. The physical development of both patients was normal in every respect until just prior to the advent of pubescence (about 8 years in the first case, and about 10 years in the second), when definite retardation began to set in suddenly but without disturbance in the general ratio of physical measurements. In both cases the roentgenographic evidence of diagnosis consisted in the general arrest in the development of the hypophysis cerebri, since the configuration of the sella turcica was normal but decidedly small as compared with that of a normal subject of the same age and sex. The first patient showed signs of Fröhlich's syndrome with adiposity around the girdle and genital infantilism; the second subject exhibited evidence of myxedema. Neither patient had diabetes insipidus, hemianopia or increased intracranial pressure; no hyperplasia of the thyroid glands was present. There was a retardation in the epiphyseal union at the ends of the long bones. The first patient gave evidence of a slight tendency to hypersensitization to pilocarpine while the second was sensitive to atropine. To one of these patients, showing myxedema, the author administered thyroid for three months, and there was some improvement in the condition of his skin, but no other noticeable changes occurred.

**Excretion of Bismuth.**—Seki presents results obtained by quantitative determinations of bismuth excreted in saliva and in urine in three patients who had received courses of anti-syphilitic treatment with salts of this metal. At the time of these observations the patients had received bismuth in total amounts varying from 0.95 to 2.16 Gm. over periods of months,

so that for the purpose of the tests the storage of bismuth was considered adequate. The purpose of the study was to ascertain the effect of pilocarpine and epinephrine injections on the excretion of bismuth in such patients. Urinary bismuth was first determined and found to be excreted to the amount of 0.08, 0.23 and 0.71 mg. in single specimens passed in one hour. Considering the quantity excreted by the first patient as 1, the ratio of urinary bismuth excretion in these three patients was 1:2.7:8.6. The serum bismuth per cubic centimeter gave the values of 0.0024, 0.0037 and 0.0053 mg. respectively, or a ratio of 1:1.6:2.2. The bismuth content of saliva per cubic centimeter was likewise determined and was found to be 0.00053, 0.00066 and 0.00070 mg. respectively, or a ratio of 1:1.2:1.3. Following the injection of 0.5 cc. of 2 per cent solution of pilocarpine hydrochloride in these patients, the excretion of bismuth increased in proportion to the body store concomitant with the increase in salivary flow up to the end of two hours. After two hours the quantity of bismuth excretion in the saliva decreased. The quantity of urine decreased after the pilocarpine injection. On the other hand, the injection of 0.6 cc. of epinephrine hydrochloride caused only a slight change, if any at all, in the urinary excretion of bismuth by these patients.

### Sovetskaya Meditsina, Moscow

Pp. 1-52 (No. 21) 1940. Partial Index

Pneumonia Therapy in Early Childhood. M. S. Maslov.—p. 3.  
Combined Hemotherapy and Streptocid (Azosulfamide) Therapy of Pneumonia of Young Children. A. M. Shapiro.—p. 9.  
Streptocid (Azosulfamide) Therapy of Pneumonia of Children. N. I. Shevchenko and I. M. Chizhov.—p. 11.

\*Arsphenamine Therapy of Septic Scarlet Fever. B. P. Brukhanskiy, N. A. Tsukerman and E. I. Kaminskiy.—p. 15.

**Arsphenamine Therapy of Septic Scarlet Fever.**—Brukhanskiy and his associates report 28 cases of septic scarlet fever in which arsphenamine therapy was used. Four of the patients died and 24 recovered. The ages of the patients varied from 1 to 15 years. The earliest effect was seen in the diminution or disappearance of the necrotizing process in the pharynx and striking improvement in the general condition. The fetid, ichorous discharge from the nose disappeared, as a rule, on the day after administration of the drug. Enlargement of the cervical lymph nodes and edema of the cellular tissue of the neck rapidly regressed. Cardiac function rapidly improved, and symptoms of adrenal insufficiency receded. The following complications were noted among the 28 patients who recovered: 2 had nephritis and 5 otitis media. The authors feel that better results could be accomplished by early exhibition of the drug. Most of their patients received the drug on the third to seventh day of the sickness. Untoward effects of arsphenamine injections can be avoided by strict individualization of the dose, which should not exceed 0.009 Gm. to 1 Kg. of weight in any instance.

### Nordisk Medicin, Stockholm

8:2303-2396 (Dec. 7) 1940. Partial Index

#### Hospitalstidende

\*Some Ocular Symptoms in Fractures of Skull. V. Larsen.—p. 2319.

**Ocular Symptoms in Fracture of Skull.**—Larsen reports 17 cases of fracture of the skull examined from three months to three years after the trauma because of which ocular changes originated or are thought to have originated. The changes after theca fractures (except fractures of the frontal bone) were anomalies of refraction not previously recognized. In cases with fracture of the base of the skull, when there had been lesion of the optic nerve, which is frequent, there was apparently a characteristic field of vision in addition to the known changes of the pupil in atrophy of the optic nerve: (1) limitation of the upper field of vision, (2) limitation of the temporal field of vision and (3) central scotoma. The lower and nasal fields of vision were only slightly decreased. While the narrowing of the outer borders of the field of vision apparently occur directly after the lesion, some time seems to elapse before central scotoma appears, so that it is probably to be regarded as a result of the reparatory processes (yielding pressure on the optic nerve by the fibrous tissue, which, instead of callus, binds the cranial bones). The author says that the diagnosis of fracture of the base of the skull can probably be made on the basis of this complex alone—central scotoma accompanied by severe upper and temporal defects in the field of vision.

### Finska Läkaresällskapets Handlingar

\*Bone Marrow Picture in Acute Infections. J. Forssell.—p. 2339.

**Bone Marrow in Acute Infections.**—Forssell refers to his earlier work on morphologic changes in the bone marrow in acute anemias due to hemorrhage and now reports on the results of his examinations in eleven cases of acute infection of the genital tract of brief duration, without noteworthy anemia. No shifting beyond the normal could be established in the granulocyte picture of the bone marrow in any of these cases, which, he asserts, confirms his conclusions that acute hemorrhages and not infections cause a shifting to the left in the granulocyte picture in the bone marrow and a neutrophilia of the bone marrow. The erythrocyte leukocyte quotient was greatly decreased by the infection, pointing to stimulation of leukocyte proliferation. No changes could be demonstrated in the size of the red blood corpuscles and none in the hemoglobin concentration of the cells. The number of eosinophil cells was reduced not only in the blood but in the bone marrow. In a case in which there was grave infection of longer duration the neutrophil cells with segmented nuclei almost disappeared from the bone marrow, while the number of myelocytes and promyelocytes increased.

### Hygiea

\*Subdural Hematoma. E. Ask-Upmark.—p. 2357.

**Subdural Hematoma.**—Ask-Upmark discusses the occurrence, pathologic anatomy, pathophysiology, clinical symptomatology and therapy of subdural hematomas on the basis of personal observations in about 40 cases. In these expansive intracranial processes, he says, the separate symptoms are often less characteristic than the general course, which is marked by (1) a history of trauma, (2) a relatively long free period and (3) intermittent periodicity in the symptoms. In the more acute cases, treated not long after the trauma, there is less danger of overlooking the trauma than in the more chronic cases, which appear for treatment in divisions of internal medicine, neurology and psychiatry. In the acute cases the free interval is shorter or may be absent. In the classic cases of chronic subdural hematomas the interval between the trauma and the onset of symptoms may be from weeks to months and years, sometimes several years, and the symptomatology is perhaps more shifting and bizarre than in any other neurologic disorder. There may be symptoms of increased intracranial pressure, in most cases more or less conspicuous mental symptoms, neurologic symptoms mainly of motor kind, and not seldom bradycardia, believed to depend on increased intracranial pressure but occasionally registered when the intracranial pressure is not increased. Examination of the cerebrospinal fluid is best made by suboccipital puncture. If this is not possible, lumbar puncture may be considered; but the diagnostic value of examination of the cerebrospinal fluid is limited by it and in suspected expansive intracranial processes lumbar puncture is as a rule contraindicated. Roentgen examination of the cranium is of value only in exceptional cases. Encephalography or ventriculography affords valuable information. Arteriography gives an especially clear picture; but the method requires a considerable intervention, and simpler means generally suffice for diagnosis and treatment. Operation consists in removal of the hematoma through a transtemporal trepanation opening, which can often be small. Preoperatively, rest and quiet are needed, as there is often psychic or motor agitation, abundant administration of fluids is called for and a timely blood transfusion is often important. Exsiccation and overheating dispose to general hyperthermia. Tachycardia is a noticeable feature in neurogenic hyperthermia and it seems to the author logical to try treatment with ergotamine tartrate (gynergen) or a prostigmine preparation for it. As a rule the postoperative course is uneventful. If this is not the case, the possibility of a subdural hematoma on the other side is to be considered.

### CORRECTION

**Estrogen and Calcium in Menopause.**—In the abstract "Estrogen and Calcium in Menopause" (THE JOURNAL, April 19, p. 1878) the dose of calcium lactate should have read 0.25 Gm. instead of 0.00025 Gm., and the dose of sodium bromide 0.05 Gm. instead of 0.00005 Gm.

## Book Notices

**The Parasites of Man in Temperate Climates.** By Thomas W. M. Cameron, Professor of Parasitology, McGill University, Montreal. Cloth. Price, \$3. Pp. 182, with illustrations. Toronto: University of Toronto Press; London: Oxford University Press, 1940.

This book is based on the course in parasitology given in the medical school of McGill University. Its contents are deliberately restricted to the needs of the practitioner in the English speaking temperate and subtropical areas with no attempt to supply the larger needs of the parasitologist or laboratory worker. There are four main sections of the book dealing with protozoa, helminths, leeches and arthropods. The section on the last group contains not only insects of medical importance but also venomous arthropods. Detailed descriptions are limited to those parasites which occur in North America and Great Britain. In each of these species a brief summary account is given of the morphology and life cycle of the parasite, various pathologic aspects of the infection, diagnosis, methods of spread and treatment. Some readers will undoubtedly feel that the discussion of some aspects of the subject should have been more adequately treated. Within the aims and physical limits of space set by the author, however, he has done remarkably well. The book is well written and illustrated and is accurate in subject matter.

**America Organizes Medicine.** By Michael M. Davis, Chairman, Committee on Research in Medical Economics. Cloth. Price, \$3. Pp. 335. New York & London: Harper & Brothers, 1941.

Before offering adverse criticisms it should be said that this book contains so much valuable material on medical economics as to entitle it to careful reading by every one interested in this subject. So far as the book has a central theme it seems to be that medicine is moving toward more and more organization. Developments are presented with more emphasis laid on the activities of medical societies and consumer organizations than on compulsory sickness insurance. However, the strong bias against organized medicine and in favor of what might be called the social service point of view is dominant. The statements of the Committee on the Costs of Medical Care and the Interdepartmental Committee and the National Health Conference are accepted as authoritative.

The subject of the quality of care as a test of the value of any method of supplying medical care is carefully avoided. By implication, at least, the test of morbidity and mortality rates is discarded, although this is the only test properly applied to all phases of medical care. Instead it is urged that some sort of "realistic standards" be established, which appears to mean those of the number of visits, days of care, and so on, all of which have been tested and found practically useless in systems of compulsory sickness insurance. The study by Miss Swackhamer on free choice is quoted without including her comment that the study was in a "slum" district with a large percentage of immigrants, which is in no sense typical. The dictators' argument that people given free choice do not always choose wisely is used; there is no mention of the potential value of such choice in controlling standards.

Some of the references to the American Medical Association contain unpardonable misstatements. For example, page 164: "Its Council on Medical Education and Hospitals inspects institutions of 75 beds and over (and some smaller ones)." The fact is that a large majority of the hospitals inspected and registered have less than seventy-five beds. The average for 1,633 "proprietary" hospitals registered in 1940 is less than fifty beds. He finds a nonexistent conflict between "state and local medical societies" and the "national body," disregarding the fact that the "national body" has no existence aside from the "state and local medical societies." The comments, page 176, on the attitude of the American Medical Association toward British health insurance are extremely misleading. The statement frequently repeated that criticism of methods of organizing medical care are always from the economic point of view is wholly false. An examination of the official statements and actions of the A. M. A. shows that criticisms are directed to effects on the quality of the medical service and never on the economic phases.

**Tratado de diagnóstico quirúrgico.** Por Adolfo Recclus E. Paper. Pp. 877, with 1,095 illustrations. Santiago, Chile: Central de Publicaciones, 1940.

This book is based on the author's wide experience in the surgical wards of the hospitals of Valparaiso, especially during the last twelve years. Although the clinical diagnosis should prevail over the roentgen, the proper knowledge of roentgenology is paramount for the exact interpretation of the roentgenograms. The majority of roentgenograms in the book are of patients observed by the author. The book is divided into eight chapters, on surgical diseases of (1) the cranium and cranial cavity, (2) the face and mouth, (3) the neck, (4) the thorax, (5) the abdomen, (6) the urogenital organs, (7) the spine, bone marrow and pelvis and (8) the extremities. The fields covered in the different chapters include: 1. Cranial trauma with or without cerebral complications, cranial trauma in the newborn, congenital and other tumors, hydrocephalus, malformations, tumors, epilepsy, exophthalmos, pathology of the cerebral nerves, craniocerebral topography, osteitis and inflammation of the brain and meninges. 2. Congenital malformations, inflammation, tumors, neuralgia, cysts, pathology and fractures of the maxilla and diseases of the salivary glands. 3. Congenital malformations, torticollis, cervical ribs, inflammation, tumors and pathology of the regional lymph nodes and thyroids. 4. Pathology of the wall of the mamma, surgical diseases of the pleura, lungs and mediastinum, inflammation and hydatid cyst of the lung, tumors of the lung and mediastinum and diseases of the heart, pericardium, esophagus and diaphragm. 5. Trauma, surgical diseases, hernia, pathology of the peritoneum, surgical pathology of the stomach and duodenum, peptic and duodenal ulcer, tumors, congenital diseases of the intestine, acute and chronic appendicitis, intestinal tuberculosis, intestinal complications of typhoid demanding surgical interventions, diverticula, tumors and intestinal occlusion, and surgical diseases of the liver, biliary tract, pancreas, spleen and anorectal region. 6. For the urogenital structures, surgical diseases of the kidneys and ureters, and pathology of the adrenals, bladder, prostate, urethra, serotum, testicle, epididymis, vas deferens and penis. 7. For the spine, bone marrow and pelvis, malformation of and trauma on spine, trauma on bone marrow, Pott's disease, spondylosis, spondylitis, tumors, acquired deformities, topographic diagnosis of medullary lesions, compression of the bone marrow by tumors and diseases of the pelvis. 8. For the limbs, congenital and acquired malformations, luxations and fractures, diseases of the soft parts, lesions of the nerves of the limbs, of the bones, of the soft parts and joints, diseases of the bones and joints, dystrophy of the bones, inflammation, chronic and infectious diseases of the joints, local necrosis and other local diseases, and free bodies in joints.

**Basic Principles of Healthful Housing.** Second edition. Paper. Price, 25 cents. Pp. 32. American Public Health Association, Committee on the Hygiene of Housing, C.-E. A. Winslow, Chairman. New Haven Conn., 1939.

This is a report from the Committee on the Hygiene of Housing of the American Public Health Association and has been endorsed by the Association's Committee on Research and Standards so that it may be released for further study. It contains chapters on physiologic needs which can be met by proper housing, such as temperature, pure air, proper lighting, protection against noise, and adequate space for exercise. It then lists fundamental psychologic needs, such as privacy, opportunities for normal family and community life, facilities for performances of household tasks, the maintenance of friendliness, the achievement of esthetic satisfactions, and conformance with social standards of the community. Protection against contagion includes the provision of safe water available to the dwelling and protection against pollution within the dwelling, proper toilet facilities, the avoidance of insanitary conditions in the vicinity, the exclusion of vermin and all further necessities. There must also be provision for keeping milk and food undecomposed. Sleeping rooms must provide sufficient space to minimize the danger of contact infection. Accident safeguards enumerated include proper planning, use of appropriate materials, fire-proofing, fire-escape facilities, protection against electrical shocks and burns and against gas poisonings, and protection against falls, mechanical injuries and neighborhood

automobile traffic. Each is made the subject of a "principle," of which there are thirty. Each principle is elucidated by one or more paragraphs sufficiently detailed to make clear what is intended. The pamphlet is enclosed in attractive covers with plastic ring binding. It should be useful to any one interested in housing, from the prospective owner to the official charged with community housing standards and their enforcement.

*Memoria y cuenta del Ministerio de sanidad y asistencia social, Estados Unidos de Venezuela (contiene las actuaciones correspondientes al año civil de 1939).* Paper. Pp. 404, with illustrations. Caracas, 1940.

The author of this book is the minister of public health and hygiene of Venezuela. The book is a report of work carried on by the various branches of the ministry in the course of 1939. It contains several chapters on the organization and functions of the body of sanitation, and hygiene and its various branches, especially for the welfare of mothers and their children, hygiene of crèches, reformatories for delinquent youths, vacationing centers for children, care of school children, social work, prevention and therapy of tuberculosis, venereal diseases, malaria, yellow fever and other diseases, propaganda, services rendered to the people by means of legal and medical consultations, vigilance of medical professions and of pharmacies, work carried on by the Instituto Nacional de Higiene and other sanitary centers, care of centers for preventing delinquency in youth, sanatoriums, hospitals and leprosaries and public dining or sleeping rooms for needy children. The problems of sanitation of the soil and housing also are discussed. The book contains illustrations, epidemiologic graphic drawings, statistics, lists of the Venezuelan physicians and other professionals who were registered in the course of 1939 and a detailed report of the income and expenses of the General Department of Public Health and its branches during the year. In his preface the author calls for cooperation of the federal and municipal authorities and civilians of Venezuela in order to carry on collective efforts. Actually Venezuelan sanitation and hygiene are constantly progressing.

*Macleod's Physiology in Modern Medicine.* Edited by Phillip Bard, Professor of Physiology, Johns Hopkins University School of Medicine, Baltimore. With the collaboration of Henry C. Bazett, Professor of Physiology, University of Pennsylvania, et al. Ninth edition. Cloth. Price, \$10. Pp. 1,256, with 387 illustrations. St. Louis: C. V. Mosby Company, 1941.

When it first appeared in 1918, the book by Macleod was recognized at once as a distinguished contribution. Now after twenty-three years the ninth edition becomes available as a massive work, entirely rewritten by a group of authors, many of them specialists in certain major fields of physiology. In addition to the contributors who developed the eighth edition, there are Howard J. Curtis, who has rewritten the chapters on electrical excitation and conduction of the nerve impulse, and Dr. Walter S. Root, who has contributed a chapter on the urinary bladder. Originally developed as a reflection of the physiology of the University of Toronto, the book now emanates primarily from Johns Hopkins University, where its distinguished editor is professor of physiology. It is a comprehensive, reliable textbook, which has been kept quite up to date. The scope of the numerous additions becomes apparent in the bibliography and becomes even more clearly apparent in the extent to which various portions of the type have been worn by repeated printing.

*Las perturbaciones hepáticas en los enfermos de tirotoxicosis.* Por el Dr. Adolfo Marcos Rey. Tesis de doctorado, Universidad nacional de Buenos Aires, Facultad de ciencias médicas, Escuela de medicina. Núm. 5208. Paper. Pp. 89, with 23 illustrations. Buenos Aires: Sebastián de Amorruu e Hijos, 1940.

The author selected the subject of disturbances of the liver in thyrotoxicosis for his doctoral thesis. The book is divided into five chapters, on relations between disturbances of the liver and thyrotoxicosis, functions of the liver, variations of liver glycogen and anatomopathologic changes in thyrotoxicosis and influence of pathologic changes of liver on morbidity and postoperative mortality in thyrotoxicosis. The book is an exposition of the development and present knowledge of the subject as seen from a review of the literature and from clinical and micropathologic observations, which were carried on by the author in the Surgical Clinic of Buenos Aires.

Following are the conclusions: The liver is either fundamentally or clinically involved in thyrotoxicosis and the glycogen of the liver is diminished. The functions of the liver improve or become normal and the clinical symptoms improve or disappear when improvement or cure is attained by surgical operation in cases of thyrotoxicosis. A plausible cause of the liver involvement is a lability of the structure from thyroid hormone or its derivative toxic substances. The pathologic alterations of the liver in thyrotoxicosis are important factors which have an influence on the morbidity and postoperative mortality of thyrotoxicosis.

*El hemoneumotorax espontaneo.* Por el Dr. Jorge M. Remolar. Tesis de doctorado, Universidad nacional de Buenos Aires, Facultad de ciencias médicas, Escuela de medicina. Acta No. 5324. Paper. Pp. 159, with 33 illustrations. Buenos Aires: Aniceto Lopez, 1940.

The author of this book selected the subject of Spontaneous Hemopneumothorax, in which he has a large experience, for his doctoral thesis. In an introductory chapter he discusses spontaneous hemopneumothorax, the importance of the various forms of the condition and the relation between spontaneous pneumothorax and spontaneous hemopneumothorax. A review of the literature, especially Argentine literature, on the subject is covered in chapters 2 and 3, which include a clinical and roentgen study of cases observed and treated by the author. The symptoms, clinical forms, differential diagnosis, course, prognosis and therapy of spontaneous hemopneumothorax are discussed in chapters 4, 5, 7 and 8. In chapter 6 the author deals with the history, pathologic anatomy and roentgen aspects of subpleural blebs, the pathogenic role of subpleural blebs, the importance of pleuroscopy and pleurophotography in spontaneous hemopneumothorax and the histology of the conditions. The book contains many roentgenograms, photomicrographs and neat illustrations in color.

*An Introduction to Dermatology.* By Richard L. Sutton, M.D., Sc.D., LL.D., and Richard L. Sutton Jr., A.M., M.D., LL.R.C.P., Assistant Professor of Dermatology, University of Kansas School of Medicine, Kansas City. Fourth edition. Cloth. Price, \$9. Pp. 904, with 723 illustrations. St. Louis: C. V. Mosby Company, 1941.

The first edition of this book appeared in 1932. The present edition has been condensed from the tenth edition of the well known book on "Diseases of the Skin" by the same authors. The literature has been brought quite up to date, the number of illustrations has been more than trebled, and all of the type has been reset. The reputé of the authors in their chosen field makes it possible for them to secure contributions of much new material from other distinguished dermatologists. As a textbook for students, this volume is to be especially recommended because of its intensely practical character, the succinct manner of presentation of the material and the excellence of the illustrations, both in form and in printing.

*State Board Questions and Answers for Nurses. Essay and Objective Types.* Compiled from Actual Examination Questions Given Throughout the Country by State Examining Boards. Nineteenth edition, 1941 revision. Cloth. Price, \$3.50. Pp. 1,084. Philadelphia, Montreal & London: J. B. Lippincott Company, 1941.

This book contains answers to hundreds of questions which were asked by nurses' examining boards throughout the country last year. The editorial board which answers these questions comprises eleven nurses or instructors in high positions in well known institutions. The questions are classified under the various subjects in which nurses are examined, such as anatomy and physiology, hygiene, pharmacology, nutrition, medical nursing, surgical nursing, obstetric nursing and the nursing of children. While the book is obviously intended to help nurses who expect to take these state board examinations, it will also serve as a guide for a thorough review and as an encyclopedia of modern knowledge on nursing.

*The Notifiable Diseases: Prevalence in States 1939.* Federal Security Agency, United States Public Health Service. Division of Sanitary Reports and Statistics. Supplement No. 163 to the Public Health Reports. Paper. Price, 5 cents. Pp. 14. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

This leaflet consists of tabulations indicating the spread of the communicable diseases in 1939 according to states. It is a useful reference for those to whom disease statistics are useful or significant.



## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

MASKS FOR PROTECTION AGAINST FORMAL-  
DEHYDE GAS

To the Editor:—Will you kindly give a formula for the material used to adsorb formaldehyde in the canister of a gas mask? Could dry antiformin serve this purpose?

ANSWER.—Formaldehyde gas may be adsorbed to a large degree by the special activated charcoal in the canister of the gas mask. Through various heating and steaming processes, the charcoal grains are changed so that fine, capillary-like tubes are obtained and adsorption is greatly increased. Although in the literature there has been mention of such simple filters, in industry some firms using formaldehyde prefer masks with a closed system with oxygen or with an intake tube extending out into noncontaminated air. It is rather rare, however, to obtain a toxic concentration of formaldehyde under ordinary practical conditions, in spite of the fact that there may be a danger of sodium formate being produced and then carbon monoxide being split off from the formate. Unless this mask has particular facilities for protection against carbon monoxide, the simple antiformin canister should not be used. Theoretically, the danger of the production of the carbon monoxide from formaldehyde is possible with any type of oxidizing agent.

## ASYMPTOMATIC NEUROSYPHILIS

To the Editor:—In September 1939 during a routine examination on a white woman aged 24 it was found that she had a 4 plus Kahn reaction. General physical examination revealed no abnormalities. The Wassermann test on 1 cc. of spinal fluid resulted in a 4 plus reaction. The gum mastic test gave negative results. A diagnosis of latent syphilis, probably early, with early involvement of the central nervous system, was made. For the next eight months the patient was treated with alternate courses of a bismuth compound and mapharsen, receiving ten injections of the bismuth compound, 2 grains (0.12 Gm.) at each dose, and twenty-four injections of mapharsen, 0.04 Gm. per dose. At this time both Kahn and Wassermann reactions of the spinal fluid gave a negative reaction to gum mastic. The Wassermann reaction was negative with 0.2 cc. of fluid, 3 plus with 0.5 cc. of fluid and 4 plus with 1 cc. At that time, May 1940, the administration of tryparsamide was begun, and the patient received a total of twenty-nine injections of 2 Gm. each. In December 1940 both the Kahn and Wassermann reactions of the spinal fluid were still 4 plus. The spinal fluid showed a normal cell count and the Wassermann reaction was negative with 0.2 and 0.5 cc. of fluid but 2 plus with 1 cc. of fluid. In January 1941 the administration of a bismuth compound was begun again, it being impossible to continue with tryparsamide because of a gastric reaction. I should like your suggestions as to future procedure in this case. In view of the favorable response in the spinal fluid, I feel that after a few weeks of therapy with the bismuth compound I could give her another course of tryparsamide. Assuming that she received tryparsamide for another six months and at the end of that time the spinal fluid was normal but the blood still positive for syphilis, what would you suggest for further therapy then? I would also appreciate a comment as to the relative merits of fever therapy and tryparsamide at the present time.

M.D., Tennessee.

ANSWER.—If the September 1939 physical examination of the patient was completely normal from the neurologic standpoint, the correct diagnosis is asymptomatic neurosyphilis. In planning treatment for such a patient, it is desirable to have some idea as to the probable duration of the infection, a point concerning which no information is supplied. While it may be impossible to date the infection on the basis of a history of lesions of early syphilis, nevertheless collateral evidence, such as the duration of marriage, if any, or the length of time over which potentially infectious exposure may have occurred, would be of value. If the duration of infection was less than two years at the time of the discovery of the positive serologic reaction of the blood, it would have been desirable to intensify the arsenical phase of treatment by larger and probably more frequent doses of mapharsen. If, on the other hand, the infection was probably older than two years, the treatment so far given seems adequate.

The procedure suggested for the immediate future, namely the trial of tryparsamide after completion of the present course of

the bismuth compound, is satisfactory. It may well be that in view of the occurrence of gastrointestinal reactions during the last course of tryparsamide the patient has become permanently intolerant to this drug, though this cannot be determined without further trial. If tryparsamide is tolerated and if the patient is of average weight (132 pounds, or 60 Kg.) it is suggested that the dose of tryparsamide be raised from the 2 Gm. level previously employed to the average therapeutic dose of 3 Gm. If, on the contrary, tryparsamide is not tolerated, fever therapy, preferably with induced malaria, would be desirable.

Assuming that tryparsamide can be given and that after twenty-six consecutive weekly injections the spinal fluid is normal but the serologic reaction of the blood still positive, it is suggested that for an ensuing six months treatment be continued as originally begun, with alternating courses of a trivalent arsenical in a maximum tolerated dosage (e.g. mapharsen 60 mg. instead of 40, arsphenamine 0.3 to 0.4 Gm.) and of bismuth subsalicylate in oil, each 0.2 Gm. At the end of this time the spinal fluid should be reexamined. If it is still normal, regardless of the serologic reaction of the blood, the patient may be placed on probation. There should then ensue an indefinite period of observation, during the first three to five years of which examination of the spinal fluid should be repeated at six month intervals and the blood test repeated by a satisfactory quantitative technic. From the serologic standpoint treatment need not be resumed unless there is evidence of a return of abnormalities of the spinal fluid or of a high titer serologic relapse in the blood. In addition the patient should undergo periodic physical examination with special emphasis on her neurologic status, at least at yearly intervals.

There is little satisfactory information as to the relative merits of fever therapy and tryparsamide in the treatment of neurosyphilis. The only recent papers on this particular point are by Solomon and Epstein (*Arch. Neurol. & Psychiat.* 33:1008 [May], 1216 [June] 1935). These authors conclude that in their hands the results of tryparsamide therapy are approximately as good as those obtained from malaria. Other workers in the field, however, without having presented evidence to document at any rate fever therapy is superior to tryparsamide. Finally, it should perhaps be said that in a patient with neurosyphilis of any category who cannot tolerate tryparsamide or in whom, in spite of the use of this drug in adequate amounts, abnormalities of the spinal fluid persist, fever therapy should be employed.

## UTEROTUBAL INSUFFLATION AND AIR EMBOLISM

To the Editor:—Would you discuss the use of carbon dioxide or air in uterotubal insufflation. The argument, as I understand it, centers primarily around the danger of producing embolism with the use of air and secondarily around the question of the comparative degree of irritant action of the two gases. Is the danger of embolism only theoretical or have there been definite cases reported in which embolism occurred? What is the actual risk as compared to theoretical risk?

Ralph E. White, M.D., Santa Ana, Calif.

ANSWER.—The actual risk of embolism during the performance of uterotubal insufflation is practically nil, regardless of whether carbon dioxide or air is used. One case of presumable air embolism was reported by Rubin (Cumulative Supplement and Composite Index of Gynecological and Obstetrical Monographs, New York, D. Appleton & Co., 1928, p. 49). The patient had had an amputation of the cervix performed some years before. The uterus contained several fibroid tumors, one the largest, being the size of a large apple. The tubes had been converted into large hydrosalpinges. The physician, not experienced with the test, first dilated forcibly the cervical canal, insufflated the uterus with gas and then curetted. This is the order of the operation as stated by the physician in question. The patient became cyanotic, and her respirations became embarrassed; anesthesia was not discontinued, but the operator "quickly finished" the curettage. She ceased to breathe under the anesthetic and was not resuscitated. At necropsy air was found in the pelvic veins, including those of the broad ligament, the inferior vena cava and the cavity of the heart. The tubes were found to be surrounded by adhesions widely distended and occluded at the fimbriated ends. The one tube was distended with blood and air.

In this unfortunate case it may be that the injury to the cervix occasioned by forcible dilation of a stenosed cervical canal may have presented the avenue of entrance into the cervical veins and thence into the broad ligament. Some of the gas held under pressure within the uterine cavity may have entered the general circulation after the endometrium was curetted, a fact demonstrated by Sampson with his bismuth experiments and in Rubin's work. Too much stress cannot be laid on this point of the

necessity of slow, careful insufflation with gas. It is striking that in the hands of the men who have employed transuterine insufflation according to all the rules of technic and indications no such accident has occurred nor anything approaching a calamity, and the number of insufflations may now be reckoned in the thousands. Rubin has demonstrated that as much as 300 cc. of gas can be introduced into the venous system without causing any harm provided the rate of injection is slow, similar to that prescribed for transuterine insufflation.

As emphasized by Rubin, carbon dioxide has proved to be the most readily absorbed of all the available gases, but air is also satisfactory for testing tubal patency. However, regardless of which gas is injected into the uterine cavity, a pressure gage should always be used. A manometer will not only prevent the use of excessive pressure but present additional evidence of the patency or nonpatency of the tubes by the rise and fall of the pressure reading. In order to avoid any complications, uterotubal insufflation should never be performed in the presence of uterine or cervical bleeding, fever, pelvic tenderness, pelvic tumors, vaginal purulent discharge and serious cardiac or respiratory disease.

#### TREATMENT FOR CYANIDE POISONING

**To the Editor:**—A treatment for poisoning with cyanide using sodium nitrite and sodium thiosulfate has been recommended: 0.3 Gm. of sodium nitrite in 10 cc. of water given intravenously and followed by 25 to 50 cc. of a 50 per cent solution of sodium thiosulfate given intravenously. What is the status of this treatment? How should the solutions be prepared to have them sterile? Can the drug be added to boiling sterile salt solution and boiled, as is done with sulfanilamide powder? Or, again, can the powdered drug be put up in papers and autoclaved?

Gail K. Ridelsperger, M.D., Warren, Pa.

**ANSWER.**—Experimental work on dogs (Chen, K. J.; Rose, C. L., and Clowes, G. H. A.: Comparative Values of Several Antidotes in Cyanide Poisoning, *Am. J. M. Sc.* 188:767 [Dec.] 1934) indicates that successive injections of sodium nitrite and sodium thiosulfate give the best antidotal action to poisoning with cyanide. In dogs, this combination of drugs was found, to detoxify 20 minimum lethal doses of sodium cyanide, which was almost three times the sum of their individual values and was ten times as effective as methylene blue. As a result, the authors cited reviewed the findings of other investigators and suggested a treatment for poisoning with cyanide. Essentially it consisted in the immediate administration by inhalation of amyl nitrite for fifteen to thirty seconds, which is repeated every two or three minutes until the solutions are injected; intravenous injection of sodium nitrite (6 to 10 mg. per kilogram of body weight) at the rate of 2.5 to 5 cc. a minute, followed with sodium thiosulfate (0.5 Gm. per kilogram of body weight) at the same rate, gastric lavage if the poison has been taken by mouth, and continuous observation of the patient for at least twenty-four to forty-eight hours. Persistence of signs of poisoning or their reappearance one hour after the initial dose is an indication for repeating the dose of sodium nitrite and sodium thiosulfate, although Chen, Rose and Clowes advocate a second injection at the end of two hours for prophylaxis even if symptoms are not present. Subsequent doses should be one half of the original dose. The two drugs must not be mixed together before injection. These investigators also advise the maintenance in large hospitals of an emergency kit consisting of pearls of amyl nitrite, ampules of sodium nitrite (0.3 Gm. in 10 cc. of water), ampules of sodium thiosulfate (25 Gm. in 50 cc. of water), two sterile syringes (10 cc. and 50 cc.), a file and a stomach tube. Whereas Chen and his co-workers injected sodium cyanide subcutaneously for experimental purposes, Etteldorf (The Treatment of Gaseous Hydrocyanic Acid Poisoning by Sodium Thiosulfate and Sodium Nitrite Combination, *J. Pharmacol. & Exper. Therap.* 66:125 [May] 1939) allowed dogs to inhale the vapors from hydrocyanic acid and found that previous intravenous administration of sodium thiosulfate and sodium protected the animals against concentrations which were four to six times as great as that necessary to produce convulsions in control animals. Again, Etteldorf reported that administration of the drugs immediately after exposure to hydrocyanic gas either results in recovery or hastens it except in those cases in which convulsive concentrations of the poison had been reached. When this occurred, the treatment appeared to be valueless. Cushny, Edmunds and Gunn (Pharmacology and Therapeutics, Philadelphia, Lea & Febiger, 1940) suggest the intravenous injection of 6 to 10 mg. per kilogram of body weight of sodium nitrite in 3 per cent solution, followed by 0.5 Gm. per kilogram of body weight of sodium thiosulfate in 50 per cent solution. They also point out the value of the inhalation of amyl nitrite as a preliminary adjuvant to this treatment. Sodium thiosulfate is marketed by a number of pharmaceutic

houses. Some of these preparations have been accepted by the Council on Pharmacy and Chemistry for inclusion in New and Nonofficial Remedies and are prepared as 10 per cent solutions (1 Gm. in 10 cc. of solution). However, if it is desired to prepare the solutions as needed, the drug may be dry heated and added to freshly autoclaved distilled water, or it may be added to distilled water and the resultant solution autoclaved. If it is desired to fill a number of ampules for future use, the solution should be prepared and the ampules filled and heated to 100 C. for thirty minutes. A general discussion on the preparation of ampule solutions is contained in the National Formulary. The solution of sodium nitrite may also be prepared as needed by sterilizing the powder with dry heat and adding to autoclaved distilled water. Solutions that deteriorate when heated may be passed through a sterile clay filter candle such as is used in the Berkefeld or Chamberland type of filter, but this process does not assure positive sterility.

#### NO TEST FOR MARIHUANA SMOKER

**To the Editor:**—Is there any method of determining whether a person is under the influence of, or has smoked, marihuana recently that would be acceptable in court? If there is a test on body fluids how should the sample be taken and preserved and where is the nearest laboratory that would test it?

M.D., Montono.

**ANSWER.**—Although there are a number of methods for identifying cannabis (marihuana) and its derivatives (Walton, R. P.: Marihuana, Philadelphia, J. B. Lippincott Company, 1938, chapter 10, pp. 164-166) there is no dependable test for determining the presence of this drug in the blood or other body fluids. In *Queries and Minor Notes* (Mescaline, Marihuana and Cocaine, *THE JOURNAL*, Jan. 13, 1940, p. 182), in answer to a similar inquiry as to whether satisfactory laboratory tests were in existence for determining the presence of cannabis in the blood and other body fluids, it was stated "There is at present no dependable specific test which will identify cannabis or the resinous active ingredient, cannabinal. It is doubtful whether sufficient material could be extracted from the blood with chloroform for purification and examination." Until a generally accepted and dependable test for determining the presence of cannabis or its derivatives is developed, a court of law would not be disposed to admit in evidence the results of a test or an analysis of the blood or other body fluids for the purpose of determining whether or not a person had smoked, or otherwise consumed, cannabis and whether or not he was under the influence of that drug at a particular time.

#### CAVIAR AS POSSIBLE SOURCE OF FOOD POISONING

**To the Editor:**—In the case of caviar being suspected as the cause of food poisoning, what would be the significance of the following laboratory report based on an examination of a sample of this caviar?

Microscopic examination: Gram-positive cocci present.

Culture: *B. subtilis* present.

M. B. Jarman, M.D., Hot Springs, Va.

**ANSWER.**—The presence of *B. subtilis* in the suspected food would indicate that it was a possible air-borne contaminant. As far as is known, this organism has not been involved in food poisoning. The most important gram-positive cocci responsible for food poisoning are certain strains of staphylococci which grow well on ordinary mediums. Therefore this laboratory report would be without value in incriminating the caviar as the cause of food poisoning.

#### BOWING OF LEGS IN INFANCY

**To the Editor:**—In *The Journal* for March 1, 1941, page 906, the answer given to the question on bowing of the legs in infancy seems to me to be inadequate. By far the majority of cases are caused by congenital variations in the anatomy of the feet which affect weight bearing so as to cause pronation. Specifically, the most common of these faults is congenital shortness of the tendon of the heel. Shortness of the first metatarsal bone resulting in pronation is also a contributing factor in many cases, and in an appreciable number the presence of an accessory scaphoid bone with the accompanying weakness of the foot and severe pronation is a positive factor. Anything which causes pronation in the foot may cause bowing of the legs, since the development of the legs and the growth of the epiphyses are dependent on function in weight bearing, and any condition which results in a shift of the normal weight-bearing line will result in a corresponding deformity of the legs. It is also interesting to note that bowing, torsion of the tibia, and knock knee may all be present at the same time in the same child. Dr. Guy Caldwell has recently shown that overweight is a definite factor in the production of deformities of the legs in children. No treatment is necessary if normal anatomy is present in the feet and if the child is not overweight. If anatomic abnormalities or overweight are present, the shoes should be so altered as to restore normal weight-bearing stress, or the deformity resulting from abnormal weight bearing cannot be expected to correct itself.

Duncan C. McKeever, M.D., Houston, Texas.

# The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 116, No. 24

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CHICAGO, ILLINOIS

JUNE 14, 1941

## SULFADIAZINE

THERAPEUTIC EVALUATION AND TOXIC EFFECTS ON  
FOUR HUNDRED AND FORTY-SIX PATIENTS

MAXWELL FINLAND, M.D.

ELIAS STRAUSS, M.D.

AND

OSLER L. PETERSON, M.D.

BOSTON

Sulfadiazine (2-sulfanilamidopyrimidine), the pyrimidine analogue of sulfapyridine and sulfathiazole, is one of a group of heterocyclic derivatives of sulfanilamide synthesized by Roblin and his co-workers.<sup>1</sup> Laboratory studies on animals indicated that this drug has less toxicity than sulfapyridine and sulfathiazole and is highly effective against experimental infections with common pathogens.<sup>2</sup> Preliminary observations in this clinic<sup>3</sup> and in a number of others in which sulfadiazine was made available<sup>4</sup> indicated that this drug was worthy of extensive trial in the therapy of human bacterial infections. This paper deals mainly with a report of the clinical use of sulfadiazine in 446 adult patients treated at the Boston City Hospital prior to March 1, 1941. The results of laboratory studies will be reviewed briefly.

### ANIMAL EXPERIMENTS

Feinstone and his associates<sup>2</sup> have shown that sulfadiazine is considerably less toxic than sulfapyridine or sulfathiazole both in acute experiments on mice and after prolonged administration in monkeys. In these animals and in rabbits absorption of sulfadiazine after oral administration was rapid, there was little acetylation and the levels of the free drug reached were higher and were maintained longer than after similar doses of sulfapyridine or sulfathiazole. Because of these observations, comparisons of efficacy were difficult to evaluate. When identical doses were used in mice,

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Department of Medicine, Harvard Medical School.

This study was carried out with the technical assistance of Mildred W. Barnes and Clare Wilcox, who also assisted in collecting the data. The chemical determinations were made by Elizabeth Shaler Smith and Alice N. Ballou. The visiting and house staffs of the medical services cooperated in this work. The sulfadiazine and specific scrums used in this study were supplied by the Lederle Laboratories, Inc.

1. Roblin, R. O., Jr.; Williams, J. H.; Winick, P. S., and English J. P.: *Chemotherapy*. 11. Some Sulfanilamide Heterocycles, *J. Am. Chem. Soc.* 62: 2002, 1940.

2. Feinstone, W. H.; Williams, R. D.; Wolff, R. T.; Huntington, E., and Crossley, M. L.: The Toxicity, Absorption and Chemotherapeutic Activity of 2-Sulfanilamidopyrimidine (Sulfadiazine), *Bull. Johns Hopkins Hosp.* 67: 427 (Dec.) 1940.

3. Peterson, O. L.; Strauss, Elias; Taylor, F. H. L., and Finland, Maxwell: Absorption, Excretion and Distribution of Sulfadiazine (2-Sulfanilamido-Pyrimidine), *Am. J. M. Sc.* 201: 357 (March) 1941.

4. Plummer, Norman, and Easworth, H. K.: Absorption and Excretion of Sulfadiazine, *Proc. Soc. Exper. Biol. & Med.* 45: 734, 1940. Rheinhold, J. G.; Flippin, H. F.; Schwartz, Leon, and Damm, A. H.: The Absorption, Distribution, and Excretion of 2-Sulfanilamido Pyrimidine (Sulfapyrimidine, Sulfadiazine) in Man, *Am. J. M. Sc.* 201: 106 (Jan.) 1941. Long,<sup>5</sup> Sadusk and Tredway,<sup>6</sup> Bullowa.<sup>7</sup>

however, sulfadiazine was found to be considerably more effective than the other drugs in the therapy of experimental infections with pneumococcus, hemolytic streptococcus and Friedländer's bacillus type B and about as effective as sulfathiazole against the staphylococcus. Long<sup>5</sup> has also found sulfadiazine to be effective in mice against infections with these organisms and, in addition, against *Escherichia coli*, *Clostridium welchii* and *Clostridium septicum* infections.

### ABSORPTION, EXCRETION AND DISTRIBUTION IN MAN<sup>6</sup>

In human subjects the maximum blood levels after oral administration of sulfadiazine are uniformly higher and are more sustained than after corresponding doses of the other sulfonamides now in common use. Little of the drug appears in the blood in the conjugated form. Excretion of the drug is somewhat delayed; it is recovered almost entirely in the urine, and about one third of the excreted drug is recovered as the acetylated compound. The appearance of the drug in the cerebrospinal fluid even after intravenous administration of the sodium salt is somewhat delayed, but the drug soon reaches and maintains a level about two thirds of that found in the blood. In other exudates, the concentrations more nearly approximate those of the blood. Neither sulfadiazine nor its sodium salt is absorbed to any significant degree from the rectum.

The drug is distributed in the various organs of the body in about the same manner as is sulfathiazole. In the kidney, however, the concentration of sulfadiazine usually is the same as in the blood. In this respect it resembles sulfanilamide and is in contrast to sulfapyridine and sulfathiazole, which are found in the kidney in considerably higher concentrations than in the blood.<sup>7</sup> The solubility of the acetyl sulfadiazine in urine is much higher than that of acetyl derivatives of sulfapyridine and sulfathiazole.<sup>2</sup> The latter condition is of interest in view of the fact that many patients with impaired renal function excrete the free and conjugated sulfadiazine more readily than is usually the case with sulfapyridine or sulfathiazole. This will appear from the data to be presented and was also mentioned by Long.<sup>5</sup>

### IN VITRO STUDIES

It is now recognized that body fluids as well as the usual laboratory mediums contain substances which inhibit sulfonamide action. Different mediums vary con-

5. Long, P. H.: The Clinical Use of Sulfanilamide, Sulfapyridine, Sulfathiazole, Sulfaguandine and Sulfadiazine in the Prophylaxis and Treatment of Infections, *Canad. M. A. J.* 44: 217 (March) 1941.

6. Sadusk, J. F., Jr., and Tredway, J. B.: Observations on the Absorption, Excretion, Diffusion and Acetylation of Sulfadiazine in Man, *Yale J. Biol. & Med.* 13: 539 (March) 1941. Peterson, Strauss, Taylor and Finland.<sup>3</sup> Plummer and Easworth.<sup>4</sup> Rheinhold, Flippin, Schwartz and Damm.<sup>4</sup> Long.<sup>5</sup>

7. Strauss, Elias; Lowell, F. C.; Taylor, F. H. L., and Finland, Maxwell: Observations on the Absorption, Excretion and Distribution of Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole, *Ann. Int. Med.* 14: 1360 (Feb.) 1941. Peterson, Strauss, Taylor and Finland.<sup>3</sup>

siderably in the degree to which they inhibit the antibacterial action of any given drug.<sup>8</sup> Our studies indicate that, in addition, a given medium may inhibit the activity of different drugs to varying degrees. It is usually not possible to determine to what extent variations in the action of different sulfonamides on any given organism are due to differential inhibition by the mediums or to intrinsic differences in the activity of the drugs, or to both these factors. In certain synthetic mediums of known composition, sulfonamide action is frequently enhanced one hundred fold or more over its effectiveness in the common infusion broths.

Previous experiments with pneumococci have indicated that the blood broth medium used in this laboratory could be used for comparative studies with sulfapyridine and sulfathiazole.<sup>9</sup> In this medium sulfadiazine is much less bacteriostatic than sulfapyridine or sulfa-

what less bacteriostatic than sulfathiazole but considerably more effective than sulfapyridine. In a completely synthetic medium<sup>12</sup> or in a simple medium<sup>13</sup> sulfadiazine was highly bacteriostatic against stock laboratory strains of Friedländer's bacillus types A and B, Flexner dysentery bacillus, *Salmonella suipestifer*, *Salmonella enteritidis*, *Salmonella paratyphosus* A and B, *Salmonella aertrycke* and *Escherichia coli communis*. In most of the experiments sulfadiazine had about the same effect as sulfathiazole and in the others it was somewhat less effective in the same concentrations. In urine, also, sulfadiazine is as effective against these organisms as sulfathiazole. As with other sulfonamides,<sup>14</sup> the bacteriostatic and bactericidal action of sulfadiazine is inhibited by para-aminobenzoic acid.

#### CLINICAL RESULTS

The laboratory evidence that sulfadiazine has a wide range of effectiveness, the relatively high concentrations of this drug that are so readily maintained in animals and in human beings and its low toxicity which became apparent from the first clinical trials led us to attempt an evaluation of its therapeutic effect in all cases of bacterial infections in which sulfonamides might prove useful. Sulfadiazine was therefore used as the only sulfonamide drug in five of the medical wards beginning November 1 and in three additional wards beginning January 1. Other sulfonamide drugs were used in these wards only while the supply of sulfadiazine was exhausted and in some patients when it became apparent that the response to sulfadiazine was not adequate. As the study progressed, it became necessary, because of the limited supply of the drug available, to exclude from sulfadiazine therapy patients with mild infections when it was felt that an etiologic bacterial incitant would not be identified. The present report includes 446 consecutive patients in whom treatment with sulfadiazine was begun before March 1. Three hundred and sixteen of these patients were treated for pneumonia. The results of treatment in this group will be analyzed in some detail. The remaining patients were treated for a large variety of infections. The clinical results in this group will be summarized briefly and the toxic effects in both groups will be noted.

#### RESULTS IN PNEUMONIA

In general, the results of sulfadiazine treatment in pneumonia (tables 1 to 4) compared favorably in every way with those obtained during the previous year with sulfapyridine and sulfathiazole,<sup>15</sup> and the cases were quite comparable as judged by the incidence of various factors which are known to influence the prognosis. Some of the pneumonias occurred as a complication of clinical influenza which occurred in epidemic form during part of this study. In a number of these cases, which will be described in detail elsewhere, the staphylococcus appeared to be the inciting agent in the pulmonary process. Others in which there were pulmonary lesions in which significant pathogens were not obtained on culture are included under the "primary" pneumonias of undetermined etiology.

TABLE 1.—*Etiologic Factors and Mortality in Pneumonia Treated with Sulfadiazine*

Etiologic Classification	Number of Patients *	Died *	Per Cent Died
A. Pneumococcal pneumonia.....	178 (33)	19 (8)	10.7
Type I.....	28 (11)	2 (2)	
II.....	6 (1)	0	
III.....	33 (6)	6 (3)	
IV.....	11 (1)	2	
V.....	12 (2)	0	
VII.....	18 (5)	6 (3)	
VIII.....	18 (4)	0	
Others.....	52 (3)	3	
B. Specific, nonpneumococcal pneumonia..	35 (7)	7 (2)	20.0
Staphylococcus aureus, alone.....	21 (3)	4	
With hemolytic streptococcus.....	5 (1)	1 (1)	
With influenza bacillus.....	3	1	
Hemolytic streptococcus.....	4 (2)	0	
Friedländer's bacillus, type A.....	2 (1)	1 (1)	
C. Etiology undetermined—"primary" pneumonia.....	52	3	5.8
Lobar pneumonia.....	20	0	
Atypical pneumonia.....	32	3	
D. Etiology undetermined—"secondary" pneumonia.....	51	19	37.3
Cerebrovascular accidents.....	13	8	
Cardiac failure.....	29	7	
Acute asthma.....	4	2	
Other serious disease.....	5	2	
All pneumonias.....	316 (40)	48 (10)	15.2

\* Parentheses indicate number of patients with positive blood cultures.

thiazole. Similar results with pneumococci were noted by Osgood and Bullowa in cultures taken from bone marrow.<sup>10</sup> In pneumococcal tests carried out in defibrinated human blood with a technic previously described,<sup>11</sup> however, sulfadiazine was found to be about as effective as sulfathiazole. In all other mediums tested sulfadiazine was less effective against pneumococci than were sulfathiazole and sulfapyridine except in a liver infusion medium,<sup>8</sup> which presumably contains the least inhibitor for all three drugs and in which all these drugs were about equally effective. In this medium a pneumococcus made fast to sulfapyridine and sulfathiazole<sup>9</sup> was also found to be fast to sulfadiazine.

Against *Staphylococcus aureus*, when a simple liver infusion medium was used,<sup>8</sup> sulfadiazine was some-

8. MacLeod, C. M.: The Inhibition of the Bacteriostatic Action of Sulfonamide Drugs by Substances of Animal and Bacterial Origin, *J. Exper. Med.* 72: 217 (Sept.) 1940.

9. Lowell, F. C.; Strauss, Elias, and Finland, Maxwell: Observations on the Susceptibility of Pneumococci to Sulfapyridine, Sulfathiazole and Sulfamethylthiazole, *Ann. Int. Med.* 14: 1001 (Dec.) 1940.

10. Bullowa, J. G. M.: Personal communication to the authors.

11. Finland, Maxwell, and Brown, J. W.: Immunological Studies in Patients with Pneumococcus Type III Pneumonia Treated with Sulfanilamide, *J. Clin. Investigation* 18: 307 (May) 1939. Spring, W. C.; Lowell, F. C., and Finland, Maxwell: Studies on the Action of Sulfapyridine on Pneumococci, *Ibid.* 19: 163 (Jan.) 1940.

12. Fildes, P.: Mechanism of the Antibacterial Action of Mercury, *Brit. J. Exper. Path.* 21: 67, 1940.

13. Sahyun, Melville; Beard, P.; Schultz, E. W.; Snow, J., and Cross, E.: Growth Stimulating Factors for Microorganisms, *J. Infect. Dis.* 58: 28, 1936. MacLeod.<sup>8</sup>

14. Strauss, Elias; Lowell, F. C., and Finland, Maxwell: Observations on the Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid, *J. Clin. Investigation* 20: 187 (March) 1941.

15. Finland, Maxwell; Lowell, F. C., and Strauss, Elias: Treatment of Pneumococcal Pneumonia with Sulfapyridine, Sulfathiazole and Serum, *Ann. Int. Med.* 14: 1184 (Jan.) 1941.

*Pneumococcic Pneumonias.*—There were 19 deaths among the 178 patients with pneumococcic pneumonia treated with sulfadiazine, a mortality of 10.7 per cent. During the previous season<sup>15</sup> there were 112 deaths among 687 patients treated with sulfapyridine or sulfathiazole with or without specific serums, a mortality of 16.3 per cent. Among the sulfadiazine treated patients 33, or 19 per cent, had positive blood cultures before treatment and 8 of these bacteremic patients died (26 per cent). More than one lobe was involved in 62, or 35 per cent, of the 178 patients; 59 per cent were over 40 years of age and 26 per cent were more than 60. The incidence of these important prognostic factors in the present series is similar to that found in the pneumococcic pneumonias during the previous year, but the mortality was slightly lower in each of the corresponding groups of sulfadiazine treated patients.

Specific antipneumococcus serums were given to supplement the chemotherapy to 16 of these patients, of whom 6 died. Ten of the recipients of serum, including 5 who died, had positive blood cultures before therapy was started.

Complications in the patients with pneumococcic pneumonias were relatively few. A sterile pleural effusion was demonstrated in 10 patients, conjunctivitis in 1, suppurative otitis media in 4, empyema in 2 and both empyema and fibrinous pericarditis in 1. The latter patient required rib resection for the empyema, while all the others recovered completely without surgical intervention.

Of the fatalities 8 patients were moribund at the time of admission and only 1 of these lived for more than twenty-four hours after the first dose of sulfadiazine. Only 2 other patients may be said to have died of the pneumococcic infection: One was a woman aged 40 who died of vegetative pneumococcic (type VII) endocarditis and old rheumatic heart disease; the other was an alcoholic patient aged 27 with severe leukopenia (1,400 per cu. mm.) and involvement of the entire right lung who had a persistent type VII pneumococcic bacteremia during four days of sulfadiazine therapy. He was then given serum and died the following day. Autopsy revealed abscess formation in the consolidated lung; the cardiac blood was sterile. The 9 other fatalities were of aged patients who died of various untoward events not directly related to the pneumococcic infection and after the latter had apparently been overcome.

The specific antibody response of a number of the patients who recovered was studied and was found to be similar to that of patients who recovered following sulfapyridine therapy.<sup>16</sup>

*Other Specific Pneumonias.*—The 35 pneumonia patients with pathogenic organisms other than pneumococci were, for the most part, severely ill at the time of admission to the hospital. Most of the cases in which the staphylococcus was predominant occurred as a complication of epidemic influenza. Recovery following chemotherapy in some of these cases was prompt and complete. In others, in spite of continued therapy, there was prolonged illness with clinical and roentgen evidence of abscess formation and localized pleural effusion. All except 1 patient recovered completely before discharge from the hospital.

Six of the deaths occurred among the patients with staphylococcic pneumonias. Three of these were of

patients with the fulminating type of rapidly spreading pneumonia complicating influenza, and death occurred within forty-eight hours of admission to the hospital. Culture of the blood of one of these patients taken before treatment yielded hemolytic streptococci but a culture of the sputum showed a predominance of staphylococci. Death occurred after thirty-six hours. At autopsy there was diffuse hemorrhagic pneumonia with ulcerative bronchitis and multiple abscesses. The contents of the abscesses yielded an abundant growth of staphylococci, but the cardiac blood was sterile. The other three deaths were of patients aged 64, 76 and 81 who died fourteen, sixteen and eight days, respectively, after chemotherapy was started. All were severely ill and showed temporary improvement under therapy. One of these patients died of pulmonary infarcts from thrombophlebitis. One of the others had multiple staphylococcic abscesses in the lung at necropsy.

Fluid was obtained by thoracentesis on 6 of the patients with staphylococcic pneumonia who recovered. The original pleural fluid and subsequent ones of 2 were all sterile. Of the remaining 4, all of whom had pleural exudates which were infected with staphylococci, 2 recovered completely under sulfadiazine therapy and repeated aspirations, while the others underwent surgical drainage by rib resection.

The 4 patients with primary streptococcic pneumonia were all severely ill and 2 had positive blood cultures at the time sulfadiazine treatment was begun. All these patients recovered completely. Two of them, including one with bacteremia, had empyema which cleared up completely with chemotherapy and repeated thoracentesis and did not require surgical intervention.

Two patients with pneumonia of type A Friedländer's bacillus were treated with sulfadiazine. One was a man aged 51 who had a negative blood culture and an atypical pneumonia involving the entire left lung at the time of admission. Chemotherapy was started before the end of the first day and the patient was afebrile and relieved of acute symptoms after sixteen hours. The other patient was a man aged 46 who had been ill six days, had a positive blood culture and a leukocyte count of 2,500 per cubic millimeter at the time sulfadiazine therapy was started. He died twenty-six hours later in spite of intensive therapy, including intravenous sodium sulfadiazine and specific rabbit antiserum.

*Non-Pneumococcic Pneumonias.*—The mortality in all the 138 cases of pneumonia treated with sulfadiazine in which pneumococci were not obtained (including those in which specific bacteria were involved) was 21 per cent, as compared with 23 per cent in the corresponding group of 95 treated with sulfathiazole during the previous year.<sup>15</sup> In both groups the mortality was higher in the atypical pneumonias (bronchopneumonia) and in those secondary to other serious illness than it was in the lobar pneumonias and in the primary pneumonias, respectively.

*Effect of Age on Mortality* (table 2).—This was most striking in the pneumococcic pneumonias (group A) and in the pneumonias classified as "primary" in which a definite etiologic agent was not identified (group C). Among the latter there were no deaths among 30 patients under 50 years of age, while less than 3 per cent of the 104 patients with pneumococcic pneumonia in this age group died. Among the specific non-pneumococcic pneumonias (group B) and the "sec-

16. Finland, Maxwell, Spring, W. C., Jr., and Lowell, F. C.: Immunological Studies on Patients with Pneumococcic Pneumonia Treated with Sulfapyridine, *J. Clin. Investigation* 19: 179 (Jan.) 1940.



ondary" pneumonias (group D) the mortality of patients over 50 was about twice as high as that of those under 50 years of age.

*Dosage of Sulfadiazine Used in the Pneumonias* (table 3).—Most of the patients received an initial dose of 2 or 4 Gm. and then 1 Gm. every four hours

TABLE 2.—Mortality in Pneumonia Treated with Sulfadiazine: Effect of Age

Age, Years	A		B		C		D		All Patients		Per Cent
	No.	Died	No.	Died	No.	Died	No.	Died	No.	Died	
13-19.....	12	0	7	1	1	0	1	0	21	1	5
20-29.....	20	2	5	0	9	0	3	1	37	3	8
30-39.....	41	0	6	0	8	0	2	1	57	1	2
40-49.....	31	1	7	3	9	0	4	0	51	4	8
50-59.....	28	4	2	0	3	0	11	3	44	7	16
60-69.....	24	4	3	1	10	1	13	4	50	10	20
70-79.....	17	4	4	1	10	1	13	8	44	14	32
80+.....	5	4	1	1	2	1	4	2	12	8	75
Totals..	178	19	35	7	52	3	51	19	316	48	15.2

Percentage Mortality					
All patients	10.7	20.0	5.8	37.5	15.2
Under 50.....	2.9	16.0	0	20.0	5.4
Over 50.....	21.6	30.0	12.0	41.5	26.0

A, B, C and D refer to groups of patients as listed in table 1.

until the drug was discontinued—usually three to five days after the fever had entirely subsided. In some of the wards the dosage was reduced to 1 Gm. every six hours after the patient became afebrile. Some of the patients with the severest attacks received an initial dose of 5 Gm. of sodium sulfadiazine either in 100 cc. or more of saline solution intravenously or in a liter of physiologic solution of sodium chloride subcutaneously (as recommended by Taplin<sup>17</sup>). About three fourths of the patients who recovered were treated for six days or less and received less than 40 Gm. of the drug. The average dose among the patients with pneumococcal pneumonias who recovered was 38 Gm. The bacteremic patients received an average of 8 Gm. more than those with negative blood cultures. There was a general tendency, especially in the earlier part of this study, to continue the chemotherapy longer than was indicated. This was definitely attributable to the low toxicity of the drug. It was also noted during the previous year that sulfathiazole treated patients were given the drug an average of one day longer than those who received sulfapyridine. With the latter, nausea and vomiting were more frequent and more severe.

Sulfathiazole was used instead of sulfadiazine during part of the course in 28 cases of pneumonia. In more than half of these cases the sulfathiazole was used for one or two days to maintain treatment after essential recovery had taken place under sulfadiazine, while the supply of the latter was exhausted. Larger amounts were used mainly in the treatment of febrile complications. In 9 cases of pneumococcal pneumonia an average of 23 Gm. of sulfathiazole was used in addition to 31 Gm. of sulfadiazine. Four patients with staphylococcal pneumonias, including the 2 who had a rib resection for empyema, received an average of 75 Gm. of sulfathiazole in addition to 54 Gm. of sulfadiazine.

*Duration of Acute Illness* (table 4).—Among the 159 patients with pneumococcal pneumonia who recovered following sulfadiazine therapy alone or supplemented

with serum (group A), 75 per cent were essentially afebrile and recovered within thirty-six hours after the first dose of the drug. During the previous season<sup>15</sup> about 68 per cent of the patients with corresponding conditions had a similar response to either sulfapyridine or sulfathiazole. Recovery in a large proportion of the patients with specific non-pneumococcal pneumonias (group B) was delayed owing to the presence of febrile complications, as already noted. In about one third of all the fatal cases death occurred within thirty-six hours after treatment was started. In most of the others there was obvious and sometimes striking improvement following sulfadiazine treatment at first, and death occurred several days later as a result of complicating conditions.

#### RESULTS IN INFECTIONS OTHER THAN PNEUMONIA

Sulfadiazine was used in the treatment of 130 patients with a variety of infections. The diseases treated are listed in table 5 with the average total amount of drug used and an estimation of the curative effect of the drug in each condition. It is possible here to mention only briefly a few of the salient features concerning each of the groups of cases:

*Acute Infections of the Upper Respiratory Tract.*—The 40 patients included in this group all appeared acutely ill when chemotherapy was started. Many of them had scattered musical and crepitant rales throughout the lungs and were suspected of having pneumonia, but roentgenograms showed no evidence of pulmonary consolidation. Eighteen of the patients were admitted to the hospital during an epidemic of influenza and had characteristic symptoms of this disease with moderate or severe tracheobronchitis. All these patients recovered rapidly and completely soon after sulfadiazine treatment was started, but it is not possible in most instances to evaluate the role of the drug in the recovery or in the prevention of complications. The 4 patients with sinusitis all had severe symptoms and high fever, and 1 had a positive blood culture for *Staphylococcus aureus* before therapy. All were noticeably improved and essentially afebrile within fifteen to thirty-six hours after the first dose of sulfadiazine. In 1 of the 2 cases of otitis media, hemolytic streptococci and staphylococci

TABLE 3.—Dosage of Sulfadiazine Used in Treatment of Pneumonia

Dose, Gm.	Pneumococcal Pneumonia		All Pneumonias	
	Recovered Cases	Fatal Cases	Recovered Cases	Fatal Cases
10 or less.....	4	7	7	10
11-20.....	18	4	35	12
21-30.....	54	3	94	7
31-40.....	44	2	67	2
41-50.....	18	1	29	4
51-75.....	18	3	27	4
76 or more.....	3	0	8	0
Average dose				
All cases.....	38	23	37	20
Bacteremic.....	44	33		
Nonbacteremic.....	36	17		

were cultured from the purulent exudate, which cleared completely in two days. In the other the purulent discharge, from which *Staphylococcus aureus* was cultured, continued for several days in spite of full doses of sulfadiazine and finally cleared. In the latter case a course of sulfathiazole therapy had previously been given without benefit.

*Erysipelas and Scarlet Fever.*—The results of therapy in 8 patients with facial erysipelas were uniformly good.

17. Taplin, G. V.; Jacox, R. F., and Howland, J. W.: The Use of Sodium Sulfapyridine by Hypodermoclysis, J. A. M. A. 114:1733 (May 4) 1940.

Four patients had severe attacks of the disease with extensive involvement, edema, high fever and toxemia. All improved definitely within twelve to thirty-six hours after the first dose of sulfadiazine. The other 4 had milder attacks which cleared promptly under treatment. Cultures of the blood of all were negative. One Negro

TABLE 4.—Duration of Acute Illness in Patients with Pneumonia After Sulfadiazine Treatment Was Started

Hours from First Dose to Essential Recovery or Death	A		B		C		D		All Pneumonias	
	Recov-ered	Died	Recov-ered	Died	Recov-ered	Died	Recov-ered	Died	Recov-ered	Died
12 or less.....	38	1	3	0	15	1	9	1	65	3
13-24.....	47	6	9	0	14	1	6	1	76	8
25-36.....	35	1	4	1	10	1	6	3	55	6
37-48.....	15	0	2	3	2	0	4	2	23	5
49-72.....	11	1	0	0	5	0	2	1	18	2
73 or more....	13	10	10	3	3	0	5	11	31	24
Totals.....	150	19	28	7	49	3	32	19	268	48

A, B, C and D refer to groups of patients listed in table 1.

patient with severe scarlet fever and leukopenia (1,700 per cubic millimeter), who failed to improve after four days of sulfathiazole treatment, continued to have fever for several days after he was changed to sulfadiazine and then recovered completely.

**Infections of the Urinary Tract.**—There was a striking difference in response between the patients with acute and those with chronic infections of the urinary tract. Among the 17 patients with acute involvement the urinary abnormalities and symptoms cleared completely and cultures became sterile fairly promptly following sulfadiazine treatment. Colon bacillus, alone or with other organisms, was cultured from the urine of most of these patients before treatment, and subsequent urines were sterile. The 12 patients with chronic infections included 3 with Friedländer's bacillus as the predominant organism in the urine (2 of these patients had previously had a nephrectomy), 2 with Flexner dysentery bacilluria and others with a variety of organisms including colon bacilli in cultures of the urine. Only 2 of these 12 patients recovered completely, and both of these had colon bacilli predominantly. Seven others were definitely improved but either had a relapse or continued to have residual symptoms. The patient with Proteus bacillus infection died within thirty-six hours. One other patient died with a complicating diabetic acidosis.

Most of the patients in this group received 6 Gm. daily, but some were given 1 Gm. every six hours during part or all of the course of treatment. Eight of the patients with chronic attacks who failed to show a complete recovery under sulfadiazine had a similar or longer course of sulfathiazole therapy given either before or after the sulfadiazine but with similar lack of success in every instance.

Three of the patients in this group showed abnormal retention of the drug with blood levels above 20 mg. per hundred cubic centimeters (free and acetylated). In none of them was more than one third of the circulating drug found in the conjugated (acetylated) form. One of these 3 patients had a rise in blood nonprotein nitrogen from 54 to 75 mg. per hundred cubic centimeters during the sulfadiazine therapy, but this dropped slowly to 32 mg. per hundred cubic centimeters within a few days. The patient's urine and symptoms, however, improved steadily during chemotherapy.

**Gonococcic Arthritis With or Without Urethritis.**—The results among patients with these disorders also varied with the chronicity of the disease. Four of the patients had symptoms for less than ten days before sulfadiazine therapy was started, and their disease was classed as acute. All these patients improved rapidly under the treatment. In 1 of them the symptoms recurred one week after discharge from the hospital and shortly after a prostatic massage. Five patients had symptoms for three weeks to several months before admission to the hospital. One of them made a good recovery; the other 4 either failed to improve or improved slowly and then had a relapse of symptoms. Each of these 4 patients also received, either before or after the sulfadiazine, a course of sulfapyridine or sulfathiazole averaging 61 Gm. These drugs likewise failed to bring about a cure.

**Meningococcic Infections.**—Sulfadiazine was used in the treatment of 2 patients with endemic meningococcic meningitis and 1 with meningococemia and arthritis (without meningitis). One of the meningitis patients was moribund on admission to the hospital and died within twelve hours. The other 2 patients recovered promptly and completely. During the course of the present study, Dingle and Thomas of this laboratory had an opportunity to treat 11 consecutive cases of epidemic type I meningococcic meningitis in Halifax, N. S. They observed an excellent therapeutic response

TABLE 5.—Summary of Results of Sulfadiazine Therapy in Infections Other Than Pneumonia

Infection	Number of Cases	Died	Evaluation of Therapy *				Aver- age Dose, Gm.
			++	+	±	0	
Acute infections of upper respira- tory tract							
Bronchitis.....	3	0	1	2	0	0	20
Pharyngitis and tonsillitis.....	13	0	7	6	0	0	19
Sinusitis.....	4	0	4	0	0	0	36
Otitis media.....	2	0	1	0	1	0	20
Clinical influenza.....	15	0	4	12	2	0	20
Erysipelas (facial).....							
Scarlet fever.....	1	0	0	0	1	0	105
Pyelonephritis and cystitis							
Acute.....	17	0	11	5	1	0	27
Chronic.....	12	2	1	1	7	3	36
Gonococcal arthritis							
Acute.....	4	0	3	0	1	0	72
Subacute or chronic.....	5	0	0	1	2	2	87
Meningococemia with arthritis.....							
Meningococcal meningitis.....	1	0	1	0	0	0	54
Meningococcal meningitis.....	2	1	1	0	1	0	22
Pneumococcal meningitis.....	4	4	0	0	3	1	49
Subacute bacterial endocarditis.....	5	4	0	0	1	4	90
Chronic pulmonary infections							
Pulmonary tuberculosis.....	8	0	0	0	2	6	42
Pleurisy with effusion.....	3	0	0	0	0	3	32
Nontuberculous (abscess, putrid empyema).....							
Focal staphylococcal infections.....	3	0	0	0	1	2	43
Intestinal and peritoneal infections.....	2	1	1	0	1	0	29
Miscellaneous febrile diseases.....	3	1	0	1	0	2	84
Totals.....	12	3	0	2	1	9	41
<hr/>							
Totals.....	130	10	39	34	25	32	

\* ++ Indicates excellent response apparently in relation to sulfadiazine therapy; +, good recovery, relation to sulfadiazine difficult to evaluate; ±, apparent benefit from sulfadiazine with relapse or incomplete recovery; 0, no definite beneficial effect of sulfadiazine discernible.

to sulfadiazine in every instance. The details in all 14 cases are reported separately.<sup>18</sup>

**Pneumococcic Meningitis.**—The 4 patients with this disease who were treated with sulfadiazine all had massive infection and bacteremia on admission. One of them died four hours after receiving the first dose of the drug. Two others died after two days of treat-

18. Dingle, J. H.; Thomas, Lewis, and Morton, A. R.: Treatment of Meningococcic Meningitis and Meningococemia with Sulfadiazine, this issue, p. 2666.

ment with the drug and with intravenous specific serum. In the fourth patient the meningitis occurred as a complication of a fractured skull with extensive brain injury. The blood and spinal fluid were rapidly sterilized following treatment with the drug supplemented with intravenous serum, but the patient died during a

TABLE 6.—Toxic Effects of Sulfadiazine Among Four Hundred and Forty-Six Cases

Toxic Effect	Number of Cases	Per Cent
Nausea.....	2	9.2
Vomiting, mild.....	36	
Vomiting, moderate.....	3	
Hematuria, gross.....	1	0.7
Hematuria, microscopic.....	2	
Increase in blood nonprotein nitrogen..	5*	1.1
Leukopenia (drop below 4,000).....	9†	2.0
Dermatitis with or without fever.....	9	2.2
Drug fever.....	1	
Headache.....	2	0.4
Crystals (? acetylsulfadiazine) in urine.....	35	7.8

\* Increases ranged from 15 to 26 mg. per hundred milliliters.

† In 6 of these cases the leukocyte count rose before the drug therapy was discontinued.

Seven cases are listed twice.

relapse of the infection five weeks later. Three of these patients received one or more doses of sodium sulfadiazine parenterally.

**Subacute Bacterial Endocarditis.**—The results of therapy with sulfadiazine in 5 cases of this disease were uniformly poor. Negative blood cultures were obtained after treatment in only 1 of these cases. In the others the bacteremia persisted in spite of continued therapy. One of the latter patients is still under treatment and the other 4 have died. The organism was *Streptococcus viridans* in 4 of the cases and *enterococcus* in the fifth. In 4 cases, all the other common sulfonamides were used in rotation before and after sulfadiazine, an average of 400 Gm. of these drugs being used—all without demonstrable benefit.

**Chronic Pulmonary Infections.**—Only 3 of the 14 patients in this group showed some improvement under sulfadiazine therapy. This was attributed in each instance to the partial relief of a superimposed acute pulmonary infection. An antipyretic effect such as that noted by Beeson and Janeway<sup>19</sup> in patients treated with sulfapyridine was not observed in any of these patients.

**Focal Staphylococcal Infections.**—In 1 case an infected hydrocele cleared rapidly after the purulent fluid was tapped and sulfadiazine given orally. Culture of the fluid yielded staphylococci as the predominant organisms and also Friedländer's bacilli. In a second case, a staphylococcal pyarthrosis was improved significantly under treatment. Evidences of infection cleared rapidly, but the joint pain persisted.

**Intestinal and Peritoneal Infections.**—One patient with known peptic ulcer had low grade fever and suggestive evidence of a subacute perforation. This patient was afebrile and symptom free during two courses of sulfadiazine therapy, but the ulcer symptoms recurred each time after the drug was stopped. A second patient with a gastrocolic fistula obtained no relief and subsequently was operated on and died. The third patient

in this group had chronic ulcerative colitis which was not affected by sulfadiazine given orally and in retention enemas. *Salmonella supester* was identified in repeated stool cultures from this patient.

**Miscellaneous Diseases.**—In this group are included 4 cases of rheumatic fever, 2 of acute leukemia and 1 each of disseminated lupus erythematosus, *S. supester* bacteremia (which proved at autopsy to arise from an infected mural thrombus at the site of an old coronary infarct), acute coronary infarction, catarrhal jaundice, infectious mononucleosis and a case of pyrexia of undetermined origin. Definite improvement was noted in only 2 cases: the patient with infectious mononucleosis was afebrile and free of symptoms on the second day of treatment, and one of the patients with acute leukemia showed a definite temporary improvement when a submaxillary abscess cleared under chemotherapy. There was temporary and partial improvement in one case of acute rheumatic fever. The patient who was treated for fever of undetermined origin was the only one of the 446 patients in whom severe renal symptoms (colic and hematuria) developed. This occurred after two and one-half weeks of continued therapy with full doses.

#### TOXIC EFFECTS

Toxic symptoms referable to sulfadiazine therapy were comparatively rare and mild. They were noted in 63, or 14.1 per cent, of the 446 patients, excluding those in whom crystals were found in the urine without other abnormalities or symptoms (tables 6 and 7).

**Nausea and Vomiting.**—During sulfadiazine administration nausea and vomiting were noted in 9.2 per cent of the patients, including those in whom this symptom was present before the drug was started. In no instance was this symptom severe. On the other hand, many patients who had been vomiting prior to the sulfadiazine therapy, either as part of their illness or as a result of therapy with other drugs, tolerated the sulfadiazine well.

**In the Urinary Tract.**—Crystals, probably acetylsulfadiazine, were noted in the urine during therapy in 35 patients. These were most frequently of the "sheaves of wheat" type and closely resembled the crystals of acetylsulfathiazole.<sup>20</sup> There were no other urinary abnormalities except in the 3 patients with hematuria. In 2 of the latter a few red blood cells

TABLE 7.—Comparative Toxicity of Sulfadiazine and Sulfathiazole in Cases in Which Both Drugs Were Given

Toxic Effect from	Number of Cases
Sulfadiazine only.....	2
Sulfathiazole and sulfadiazine.....	11
Sulfathiazole only.....	28
Neither drug.....	25
Number treated with both drugs.....	66

were noted in the urine in the course of therapy, but subsequent specimens of urine taken while the drug was continued were free of blood. In 1 patient ureteral colic and gross hematuria developed followed by anuria on the seventeenth day of therapy. This was promptly relieved by catheterization of the ureters and pelvic lavage. The concentration of sulfadiazine in the blood at the time was 19.8 mg. per hundred cubic centimeters, of which 1.5 mg. was the acetyl derivative. The first urine voided after the catheterization con-

19. Beeson, P. B., and Janeway, C. A.: The Antipyretic Action of Sulfapyridine, *Am. J. M. Sc.* 200: 632 (Nov.) 1940.

20. Sunderman, F. W., and Pepper, D. S.: Sulfathiazole in Blood and Urine, *Am. J. M. Sc.* 200: 790 (Dec.) 1940.

tained 271 mg. per hundred cubic centimeters of sulfadiazine, of which 150 mg. was of the acetyl derivative.

Five patients showed a significant rise in nonprotein nitrogen during sulfadiazine therapy. The concentration of sulfadiazine in the blood of 1 of these patients who was treated for pneumonia rose and reached a level of 44 mg. per hundred cubic centimeters, of which 26 mg. was of the acetyl derivatives. This was the highest percentage of acetylation of sulfadiazine in the blood noted in this study but the patient had no untoward symptoms. There were 16 other patients with elevated levels of nonprotein nitrogen (ranging from 43 to 91 mg. per hundred cubic centimeters of blood) before sulfadiazine therapy was started whose levels dropped 20 to 41 mg. per hundred cubic centimeters during the course of drug therapy.

*Leukopenia.*—Drops in the leukocyte count from high or normal to below 4,000 per cubic millimeter were noted in 9 cases. There was a proportionate drop in the granulocytes. In 6 of the cases the drop occurred during the first four days and the leukocyte count rose again while the drug therapy was continued. In the other 3 the low counts were noted between the eleventh and the sixteenth day of therapy, and the lowest count was 2,000 per cubic millimeter. In these cases the drug was stopped and the leukocyte count promptly rose.

There were 8 other patients with initial leukocyte counts below 4,000 before treatment whose counts rose during therapy. One of these had severe alcoholic pneumonia, with bacteremia and infected pleural fluid. His leukocyte count before treatment was 500 per cubic millimeter. This rose gradually under sulfadiazine and serum therapy, and the patient made a complete recovery.

*Dermatitis and Fever.*—Only 1 patient had fever as the only symptom that could be attributed definitely to the drug. A rash was noted on 9 patients. This was morbilliform in each instance, except in 1 patient whose rash was of the "erythema nodosum" type, resembling those often seen in sulfathiazole treated cases. The rash appeared on the fourth day of treatment on 1 patient and after eight to fourteen days of sulfadiazine therapy on the others. In each instance the rash cleared promptly when the drug was stopped. In another patient, readministration of the drug one week later resulted in a recurrence of the rash after twenty-four hours.

*Miscellaneous.*—Headache and slight dizziness were noted during treatment of 2 patients and were relieved when the drug was stopped. Anemia, either of the acute or of the slowly progressive type, resulting from chemotherapy, was not observed in any of these patients. Jaundice did not develop in any patient under treatment. Three patients with clinical and laboratory evidence of impaired hepatic function were treated with full doses of sulfadiazine. In 2 of these patients the hepatic function improved and in the other it remained unchanged during treatment.

*Comparison with Sulfathiazole* (table 7).—Each of 66 patients received a separate course of both sulfathiazole and sulfadiazine. This offered an opportunity for the comparison of the toxic effects of the two drugs in the same patients. Some toxic symptoms, mostly nausea, vomiting, hematuria and dermatitis, were noted in 39 patients while they were receiving sulfathiazole, but only 13 had any untoward effects from sulfadiazine. Twenty-eight patients had symptoms from sulfathiazole and not from sulfadiazine, while the reverse was true in only 2 patients.

#### SUMMARY AND CONCLUSIONS

Sulfadiazine was used in the treatment of 446 patients with various infections. It appeared to be highly effective in the treatment of the following diseases: pneumococcal, staphylococcal and streptococcal pneumonias; meningococcal infections; acute infections of the upper respiratory tract including sinusitis; erysipelas; acute infections of the urinary tract, particularly those associated with *Escherichia coli* bacilluria, and acute gonorrheal arthritis.

No well defined beneficial effects were noted from its use in the treatment of chronic infections of the urinary tract, chronic gonococcal arthritis, subacute bacterial endocarditis or chronic pulmonary infections. However, in all patients with these conditions in whom sulfadiazine therapy was not effective and in whom other sulfonamides were tried, the latter were likewise ineffective.

The results in the cases of pneumococcal pneumonia treated with sulfadiazine are comparable in every respect with the best results obtained in this clinic with the use of either sulfapyridine or sulfathiazole. In all the other conditions the numbers of cases are too few to warrant definite conclusions or comparisons. In general, sulfadiazine appeared to be as effective as sulfapyridine or sulfathiazole in every condition in which it was used.

Toxic effects from sulfadiazine were relatively mild and infrequent. Nausea and vomiting occurred in 9.2 per cent of the cases. Nitrogen retention of moderate degree was noted in 5 cases. Leukopenia occurred early and was transient in some cases. In 3 cases the leukocyte counts dropped between the eleventh and the sixteenth day and returned to normal on cessation of therapy. Morbilliform eruptions were observed in 9 cases and usually appeared on the eighth day or later. In 1 case renal colic, hematuria and anuria were relieved by ureteral catheterization.

A number of patients with definite evidence of renal or hepatic damage were treated with sulfadiazine without further impairment and, in some instances, with actual improvement of function in the course of therapy. Some patients with initial leukopenia showed a rise in the white blood count during sulfadiazine therapy.

Sixty-six patients received both sulfathiazole and sulfadiazine, and toxic effects from sulfathiazole were three times as frequent as they were during sulfadiazine therapy.

Sodium sulfadiazine in physiologic solution of sodium chloride was used for the initial dose in some of the most severe cases. No untoward local or systemic effects were noted from its administration in concentrations of 1 to 5 per cent of the drug intravenously or 0.5 per cent subcutaneously.

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*The Discoveries of Claude Bernard.*—Claude Bernard (1813-1878), the great physiologist, made at least three important discoveries: (1) the digestive action of the pancreatic juice; (2) the glycogenic function of the liver; and (3) the discovery of the vasomotor nerves, which is his outstanding contribution to psychiatry. Since the vasomotor fibers are distributed through all tissues of the organism and are involved in reflex control, researches on the action of various chemical substances, peripheral resistance, blood pressure phenomena, reflex equilibrium, organic animal life and environment and the effect of emotions upon the organism, as well as many other types of investigation, have been made possible.—Lewis, Nolan D. C.: *A Short History of Psychiatric Achievement*, New York, W. W. Norton & Co., Inc., 1941.

## AN ACUTE MEDIASTINOCARDIAC REACTION FOLLOWING IRRADIATION IN HYPERTHYROIDISM

REPORT OF THREE CASES

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AND

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Within the past three years we have encountered 3 patients with thyrotoxicosis in whom a clinical picture strongly suggesting an acute noninfectious mediastinocardiac reaction appeared during or shortly after irradiation of the thyroid gland and upper mediastinum. The clinical picture was characterized by acute severe precordial and retrosternal pain aggravated by thoracic movement, electrocardiographic changes of the type associated with acute pericarditis, fever, the absence of significant physical signs and of preceding infection and uncomplicated recovery within a few days. In view of the striking character of this reaction and because of our inability to find a description of a similar clinical picture in the literature, a report of our cases seems desirable.



Fig. 1 (case 1).—A, tracing made July 6, 1937 shows deflection of the RS-T segment, most noticeable in lead 2, and deformity of the T wave. B, tracing made May 15, 1939 is entirely normal except for occasional auricular extrasystoles (not shown here) and left axis deviation. In both A and B lead 4 was made with the electrode of the right arm over the apex and paired with the left leg.

## REPORT OF CASES

**CASE 1.**—Mrs. E. W., aged 33, began to notice fatigue, nervousness and loss of weight soon after the removal of tonsillar remnants in June 1936. When she was first seen on June 25, 1937 there had been a loss of 25 pounds (11 Kg.). Examination revealed slight prominence of the eyes with conjunctival injection, tachycardia, tremor, a widened pulse pressure and a moderate, diffuse, somewhat firm enlargement of the thyroid gland. Her blood pressure was 140 systolic and 50 diastolic, the cardiac rhythm was normal and there was a soft blowing apical systolic murmur. She had had two operations to remove the tonsils in an effort to relieve deafness, but there was no past history of acute tonsillitis, quinsy, chorea or rheumatic fever. The basal metabolic rate was +47 per cent. A diagnosis of toxic diffuse goiter was made and irradiation was begun June 29.

Irradiation was given to the thyroid gland on June 29 and 30 and July 1 and 2. This included 204 roentgens delivered anteriorly to the neck through a rectangular portal 10 by 16 cm., the lower portion of which included the upper mediastinum. Four hundred and ten roentgens was delivered posteriorly through a rectangular portal 10 by 16 cm. No iodine was given at any time.

On July 2 the patient felt a little chilly, and about midnight she was awakened by a severe retrosternal pain which

penetrated through the middle of her chest to the interscapular area. This pain was aggravated by deep breathing, and she was unable to lie down but felt as though she had to sit erect and keep her thorax immobile. There was no radiation of the pain to either shoulder or to the arms. The symptoms continued with increasing severity until she was seen about 1:30 p. m. July 3. At this time her temperature was 100 F., the pulse rate 88 with normal rhythm and the blood pressure 115 systolic and 70 diastolic. Respiration was shallow, uneasy and accompanied by slight grunting. Examination of the heart revealed only slight tachycardia and the apical systolic murmur previously noted; examination of the lungs showed only diminished aeration throughout. Nothing suggestive of pericardial or pleural friction could be heard. The patient was given  $\frac{1}{4}$  grain (0.016 Gm.) of morphine sulfate and was immediately transferred to the hospital.

The leukocyte count on admission showed 14,800 cells per cubic millimeter, with 91 per cent neutrophils, 5 per cent lymphocytes and 4 per cent monocytes. Her temperature was 101.1 F. on admission. The following day the pain was much better. The temperature had returned to normal and the leukocyte count had dropped to 5,150 per cubic millimeter. There were still no abnormal pulmonary signs; but auricular fibrillation was present with a rapid ventricular rate. Administration of quinidine sulfate was begun, 0.2 Gm. every four hours. On July 5 the cardiac rhythm had reverted to normal, and the patient's symptoms had practically disappeared except for slight retrosternal pain on yawning. The administration of quinidine sulfate was stopped.

An electrocardiogram on July 6 showed changes of the sort sometimes found in acute pericarditis with T waves of low amplitude and deflection of the RS-T segment (fig. 1A). The patient's symptoms had entirely disappeared by this date. On July 8 she received a final dose of radiation consisting of 205 roentgens delivered anteriorly through the same portal previously employed. Unfortunately at this time the relationship between the irradiation and the patient's acute thoracic symptoms was not appreciated. This fact, together with her economic limitations, explains why more complete and detailed studies were not made at the time. The thyrotoxicosis continued to improve steadily with a progressive gain in weight and subsidence of the goiter. No more irradiation was given. On October 12, the basal metabolic rate was -9 per cent and on Feb. 3, 1940 it was +3 per cent. An electrocardiogram made May 15, 1939 showed occasional auricular extrasystoles and left axis deviation but was otherwise normal (fig. 1B). Periodic physical examination of the heart since that date has revealed nothing of significance, and the patient is now entirely well except for chronic deafness and nasal allergy.

**CASE 2.**—Mrs. L. W., aged 30, was seen in consultation with Dr. I. S. Ravdin, who has given us permission to report her case.

In October 1937 signs and symptoms of thyrotoxicosis first appeared, the basal metabolic rate at that time being +45 per cent. After prolonged rest and sedation, there was gradual improvement, and in March 1938 the basal metabolic rate was +7 per cent. On November 29 the basal metabolic rate was +18 per cent. In January 1939 thyrotoxic symptoms again became manifest, and irradiation of the thyroid gland was begun February 1. This therapy was repeated on February 2, 3, 27 and 28 and on March 1, 2, 28, 29 and 30. A total of 919 roentgens was given through each of two skin portals 10 by 15 cm. over the right and left anterior portion of the neck, and a total of 744 roentgens was given through each of two skin portals of the same dimensions over the right and left portions of the neck posteriorly. The total dose of radiation received, therefore, was 3,326 roentgens. During the last series of treatments on March 28, 29 and 30, the total dose received anteriorly was 526 roentgens and the total posterior dose was also 526 roentgens. On March 13 the basal metabolic rate was +36 per cent.

Early in March the patient became pregnant, and during the next few weeks her symptoms were considerably aggravated. She received no iodine but was given sedatives and kept at rest much of the time. On April 2, while at rest in bed, the patient was suddenly seized by a sharp precordial pain which radiated



toward the lower left axilla and through the middle and upper retrosternal regions. This pain was made worse by respiration or other movement of the thorax and continued with little respite until her admission to the hospital on April 3.

At the time of admission, her temperature was 100 F., blood pressure 120 systolic and 60 diastolic, pulse rate 120 and respiratory rate 24. The leukocytes numbered 9,300 per cubic millimeter with 86 per cent neutrophils. The patient was nervous and apprehensive, and respiration was apparently painful. There was slight exophthalmos and a diffuse, moderate, soft enlargement of the thyroid. The lungs were essentially normal on examination, and the heart showed only tachycardia with a normal rhythm; no pleural or pericardial friction rub could be heard. An electrocardiogram made soon after admission showed a pattern suggesting acute pericarditis with elevation of the RS-T segment in leads 1 and 2 (fig. 2 *A*). The following day, the pain had decreased considerably and the fever had subsided. One examiner thought that a definite friction rub was audible in the lower left part of the left axilla. An electrocardiogram made on this date showed auricular extrasystoles and deformities of the T wave in various leads (fig. 2 *B*). The deflection of the RS-T segment was less noticeable than in the first tracing. Roentgen examination of the chest on April 5 gave negative results. The pain had practically disappeared by this time and did not recur. Electrocardiograms made April 10 and 18 showed a progressive return toward normal (fig. 2 *C* and *D*). The basal metabolic rate on April 19 was +23 per cent.

The patient left the hospital April 21 with no cardiac or pulmonary signs or symptoms although still presenting a picture of moderate thyrotoxicosis. Further irradiation to the thyroid gland was given in May and June 1939 without any untoward reaction. An electrocardiogram made May 17 showed simple tachycardia but was otherwise normal (fig. 2 *E*). The patient remained moderately thyrotoxic throughout the summer and was kept at rest a large part of the time. An electrocardiogram made October 7 showed simple tachycardia but was otherwise normal. By November the thyrotoxicosis had greatly abated and the patient was uneventfully delivered of a normal child December 11. Except for occasional nervousness she has remained well since.

**CASE 3.**—*M. N.*, a man aged 46, had had pleurisy with effusion at the age of 16. His symptoms disappeared after thoracentesis. A few years later he was told that he had a "spot" in his lungs and was sent away to rest for several months. No roentgenograms were taken at that time. He remained well thereafter until 1927, at which time he had thyrotoxicosis, and a thyroidectomy was done in Richmond, Va. In 1930 his thyrotoxic symptoms recurred, and a second thyroidectomy was performed in New York. In 1932 thyrotoxic symptoms again recurred, and he began the use of iodine, which was continued intermittently until April 1940. In 1934 he received a short course of irradiation to the thyroid region with temporary amelioration of his symptoms. On March 19, 1940, he suffered a short attack of grip with fever, generalized aching and malaise. Gradual recurrent enlargement of the thyroid gland had been noted for some months together with recurrent thyrotoxic symptoms. Accordingly, irradiation of the thyroid gland was again begun in the private office of a Philadelphia roentgenologist. Treatment was given on March 23, 27, 29 and 30 and April 1 and 3. Treatment was given through a lateral portal on each side of the neck and a median portal which included the upper sternal region. The dose received through each portal was 198 roentgens. It should be noted that the patient was taking 10 drops of tincture of iodine regularly each day from March 19 to April 9. A mild diarrhea began about April 5.

On April 6, while stoking his furnace, the patient suddenly felt dizzy and fainted. On recovery he noted a sharp precordial pain which lasted for several minutes but did not radiate. It seemed to be aggravated by respiration or any other movement

of the thorax. This sharp pain continued to recur at irregular intervals but with somewhat decreasing frequency and was accompanied by a duller, more constant, nonradiating retrosternal pain which likewise was made worse by movement of the thorax. The patient was attended by his family physician and on April 9 was admitted to the medical service of Dr. O. H. P. Pepper at the Hospital of the University of Pennsylvania.

It seems certain that the patient received digitalis, but the amount and duration of such therapy is not clear. He stated that he received a large amount of digitalis during the day after the onset of symptoms, but according to another statement he had been taking 4 drops of tincture of digitalis daily for about a month prior to his admission to the hospital.

On admission, he appeared acutely and severely ill. The temperature was 101 F., the radial pulse rate 88, the respiratory rate 22 and the blood pressure 130 systolic and 70 diastolic. There was moderate exophthalmos and a diffuse, noticeable firm enlargement of the thyroid gland, the left lobe being decidedly tender. There was slight cyanosis of the nail beds and advanced erythema of the neck and the upper part of the chest. The pharynx and tonsils were acutely congested. Respiration obviously caused discomfort, and the patient attempted to keep his thorax immobile. Examination of the lungs was negative except for a few crackling rales at the bases of both. The cardiac rhythm was totally irregular (auricular fibrillation). The ventricular rate was rapid, and a systolic murmur was audible at the apex and at the base. In addition, an adventitious sound

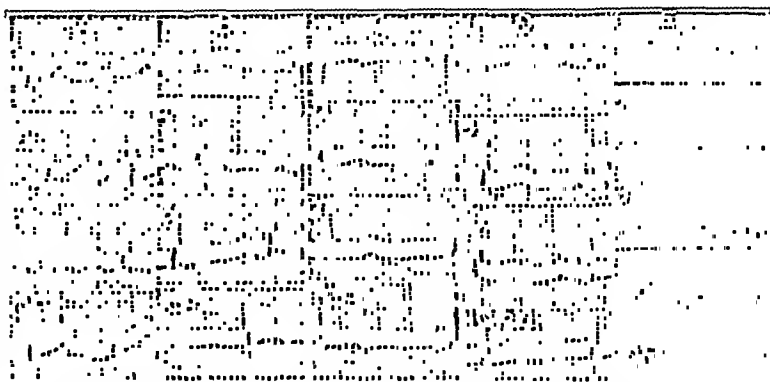


Fig. 2 (case 2).—*A*, tracing made April 3, 1939 shows deflection of the RS-T segment most noticeable in lead 2. *B*, tracing made April 4 shows an occasional auricular extrasystole (first beat in lead 2), less deflection of the RS-T segment and beginning deformity of the T wave. *C*, made April 10, and *D*, made April 18, still show some deformity of the T wave. *E*, which was made May 17, is entirely normal except for tachycardia. Subsequent tracings were also normal.

was heard over the base of the heart which was variously interpreted by different examiners. It was harsh and loud during systole, but there was a difference of opinion regarding its diastolic audibility. (The majority of observers felt that this was not a true pericardial friction rub, and this belief was supported later by the fact that the sound persisted long after the patient's pain and other acute symptoms had subsided. It probably represented a type of adventitious sound frequently heard over the cardiac base in persons with thyrotoxicosis, the mechanism of the production of which is not yet clear.)

The hemoglobin content was 69 per cent and the leukocytes numbered 8,500 per cubic millimeter, with neutrophils 65 per cent, lymphocytes 20 per cent, monocytes 7 per cent and eosinophils 8 per cent. Subsequent blood cell counts taken at short intervals during the patient's stay in the hospital showed moderate anemia with leukocyte counts ranging from 4,800 to 6,900 per cubic millimeter. Except for the 8 per cent eosinophils found on admission, the eosinophilic percentage of his leukocytes did not exceed 4.

An electrocardiogram was made on the day of admission (fig. 3 *A*). This showed auricular fibrillation, ventricular extrasystoles, slight prolongation of the QRS complex and diphasic T waves in lead 1. A tracing made April 18, after no digitalis had been taken for nine days, showed a normal rhythm, a PR interval of 0.2 second and disappearance of the intraventricular conduction defect which had been present in the previous tracing

(fig. 3 B). The T waves were practically flat in lead I and somewhat deformed in the chest leads. However, a comparison of the T waves with those of the first tracing could not be made because of the digitalis and because the defect in intraventricular conduction may also have influenced the T waves in the first tracing. A tracing made April 27 showed a PR interval of 0.16 second. At this time there was slight inversion of the T waves in leads I and 2 and in the chest leads  $CF_4$  and  $CF_5$  (fig. 3 C). The shortening of the PR interval suggested that there may still have been some effects of digitalis on April 9, when the PR interval was 0.2 second. A tracing made May 8 showed flattening of the T waves in lead I and lead 2 and small diphasic T waves in the chest leads  $CF_4$  and  $CF_5$ , indicating a change toward normal (fig. 3 D). A tracing made June 1 was entirely within normal limits. The tracings obtained from April 18 until June 1 show a series of changes entirely consistent with a diagnosis of pericarditis rather than myocardial infarction. This view is based on (1) the absence of any of the types of change in the QRS complexes to be expected in myocardial infarction, (2) the pattern of inversion of the T wave and (3) the rapidity of reversion to normal. Digitalis can be ruled out as a cause of these changes even though a large dosage of the drug may have been taken prior to April 9. The period seemed entirely too long for the changes to be accounted for solely by digitalis.

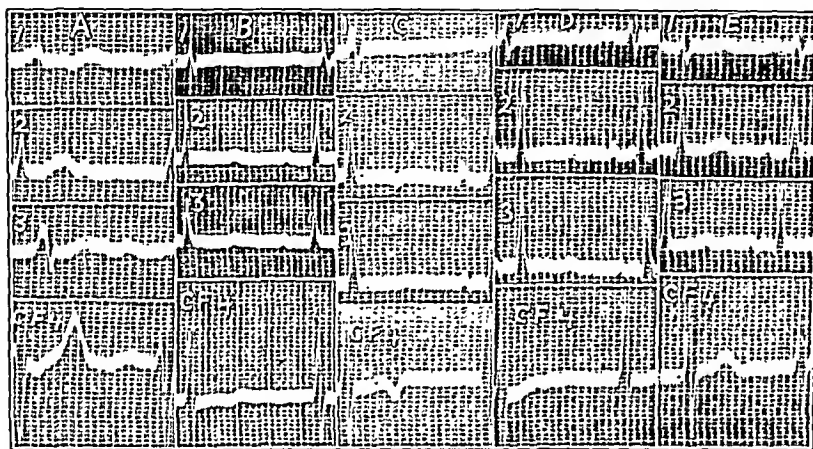


Fig. 3 (case 3).—A, tracing made April 9, 1940 shows auricular fibrillation, a slight defect in intraventricular conduction (present in most beats) and deformity of the T wave in the beats of lead I which show the defect in intraventricular conduction. Ventricular extrasystoles were also present but are not shown here. B, tracing made April 18 shows a top normal PR interval (0.2 second) and deformity of the T wave. C, tracing made April 27 shows a PR interval of 0.16 second but greater deformity of the T wave. D, tracing made May 8 shows lessening of the deformity. E, tracing made June 1 is within normal limits and is similar to one made three months later.

On April 11, the attacks of precordial pain were much less frequent and the interval pain had almost disappeared. A maculopapular eruption was noted on the wrists and forearms, and during the next few days this extended to the legs and the upper part of the chest, becoming partly vesicular and later hemorrhagic. Multiple arthralgia first appeared on April 11 and continued to be annoying for about five days. On April 12 the patient complained of stiffness of the neck with pain on motion of the head or neck. Rather profuse epistaxis also occurred that day. The following day diffuse tracheobronchitis was noted, but for the first time the cardiac rhythm was observed to have reverted to normal and remained normal thereafter. The patient's temperature was still elevated but had shown a downward trend since admission. A mild, irregular fever persisted until April 28, after which there was only an occasional isolated slight rise in temperature. On April 14, because of continued stiffness of the neck as well as some mental confusion and the presence of a positive Kernig reflex, a lumbar puncture was performed. The spinal fluid showed pellicle formation and a slight increase in protein content. During the next few days, the mental confusion and the signs of meningeal irritation disappeared rapidly, and a lumbar puncture performed April 22 revealed normal spinal fluid. On April 22 the basal metabolic rate was +25 per cent, and on May 3 it was +35 per cent.

At this time the patient was definitely improved although still obviously thyrotoxic.

Despite the probability that iodism had accounted for at least part of his original clinical picture, it was felt that the resumption of small doses of iodine was justifiable in an attempt to prepare him for subtotal thyroidectomy, especially in view of the fact that he had received no iodine since his admission to the hospital. Accordingly, he was given 3 minims (0.18 cc.) daily of a saturated solution of potassium iodide on May 3, and on May 9 a maximal subtotal thyroidectomy was performed by Dr. E. L. Eliason. Postoperative convalescence was uneventful, and the patient was discharged May 19. He was last seen June 1, at which time he was entirely symptom free. Cardiac examination on this date showed normal rhythm and a faint apical systolic murmur. The adventitious sound previously heard over the cardiac base was not audible.

Case 3 has been reported in some detail because of its complexity and the bizarre clinical picture, which caused a number of diagnoses to be considered when the patient was first seen. Eventually it seemed clear that the whole picture could best be explained by the occurrence of acute iodism in a patient with thyrotoxicosis, complicated by an acute mediastinocardiac reaction

following closely on irradiation of the thyroid region and the upper mediastinum. The occurrence of iodism in thyrotoxic persons has recently been well described by Barker and Wood.<sup>1</sup> All of our patients phenomena are included among the observations on their cases with the exception of the thoracic pain, the electrocardiographic records and the meningeal signs.

In considering the diagnosis of iodism in case 3 the fact must be recalled that the patient had taken iodine intermittently since 1932 with impunity. Three, and probably 4, of Barker and Wood's patients<sup>1</sup> likewise had previously taken iodine without a reaction. Dr. O. H. P. Pepper suggested that the systemic manifestations of iodism might have followed the liberation of iodine from the thyroid and mediastinal tissues as a result of their exposure to radiation and that the presence of iodine in these structures

might in some way have facilitated the acute mediastinocardiac reaction which followed irradiation. Such a hypothesis, however, is not susceptible of proof at this time. Our patient did not remember whether he had been taking iodine during his course of irradiation in 1934.

#### COMMENT

The principal clinical features of all 3 cases are strikingly similar except for the complicating factors in case 3, which were probably the result of iodism. The retrosternal and midthoracic reference of pain, as well as its striking aggravation by thoracic movement in all 3 cases, strongly suggests some type of inflammatory process involving the mediastinal pleura or the areolar tissue and the other contents of the mediastinum. The absence of any true friction rub (except the transitory rub noted in case 2 in the lower part of the left axilla by one observer) and the absence of any definite indications in the roentgenograms of the chest taken in

1. Barker, W. H., and Wood, W. B., Jr.: Severe Febrile Iodism During Treatment of Hyperthyroidism, *J. A. M. A.* 114: 1029 (March 23) 1940.

cases 2 and 3 by no means exclude such an inflammatory process. It is noteworthy that in no case was there any history of rheumatic infection or of any other acute infectious process immediately preceding the onset of symptoms, except the grip, which preceded by eighteen days the onset of symptoms in case 3. In view of this fact, as well as the brief duration of symptoms and the complete absence of any permanent sequelae in all the cases, an infectious cause of the reaction seems highly unlikely. Likewise, so far as we are aware, acute spontaneous reactions of this type occurring in the course of hyperthyroidism have never been reported. The possibility of some other acute cardiac episode producing similar symptoms (for example, myocardial infarction) seems to be excluded by the electrocardiographic record.

It is difficult to determine the exact nature of the cardiac disturbance which produced the electrocardiographic changes in our cases. The pericardium itself was not exposed to irradiation. It would not be difficult to assume that an inflammatory process due to infection might extend directly from the mediastinal contents or pleurae to the pericardium and to the underlying myocardium (which must be responsible for the electrocardiographic changes in acute pericarditis), but such an assumption is not so easy in the absence of infection. Electrocardiographic changes do occur in uncomplicated hyperthyroidism,<sup>2</sup> but the abnormalities reported here were not of this type. Furthermore, in case 2 they disappeared long before the thyrotoxicosis, and in case 3 there had been definite change toward a normal pattern prior to operative relief of the hyperthyroidism. It is conceivable, but unlikely, that temporary myocardial change resulting from the absorption of toxic inflammatory products in the mediastinum may have produced the electrocardiographic changes. The pattern, however, is most suggestive of acute pericarditis with underlying myocardial involvement, and the absence of definite pericardial friction rub or effusion does not by any means exclude this possibility.

The occurrence of undoubted acute infectious mediastinitis with transitory electrocardiographic changes of the type associated with : by the following episode:

A physician aged 40 had acute severe retrosternal pain extending down both arms and accompanied by fever five days after a fish bone penetrated the pharyngeal wall. An electrocardiogram made about twelve hours after the onset showed deflections of the RS-T segment suggesting an acute pericarditis. Physical examination of the heart and lungs gave negative results. The thoracic pain completely disappeared within a few hours after incision and drainage of a retropharyngeal abscess, and the electrocardiographic pattern reverted toward normal during the next four days.

There could be little doubt that acute mediastinitis with extension to at least outer layers of the myocardium had followed the retropharyngeal infection.

Acute and chronic inflammatory reactions following irradiation in various organs have been extensively studied.<sup>3</sup> Changes occurring in the bronchi, lungs

and pleura have been particularly well described by Desjardins<sup>4</sup> and more recently by Warren and Spencer.<sup>5</sup> Pericardial and myocardial reactions following direct exposure of these structures to large doses of radiation have been observed in experimental animals by Warthin and Pohle<sup>6</sup> and by Hartman.<sup>7</sup> Desjardins<sup>4</sup> reported extensive structural changes in the human myocardium and pericardium following irradiation of the breast, thorax and lungs. Acute tracheobronchitis, pharyngo-esophagitis and acute or subacute pneumonitis are well recognized reactions to radiation in therapeutic dosage. It seems entirely reasonable, therefore, that an acute sterile inflammatory reaction of the mediastinal pleurae or the mediastinal contents might have followed irradiation in our cases. The possibility must be considered that the retrosternal pain, the fever and the electrocardiographic changes were due merely to simple acute pericarditis which occurred by chance just at the time of irradiation. If the sequence of events had occurred in only 1 case, this possibility could not be excluded. However, the time relations of the events in 3 cases, 2 of which came under our observation within a single year, would appear to make such an assumption improbable.

The only report in the literature which we have been able to find of a reaction resembling that in our cases is of a patient described by Strasser<sup>8</sup> in 1912 in whom acute anginoid pain accompanied by fever and a pleural friction rub occurred during intensive irradiation of a mediastinal tumor. No electrocardiogram was mentioned in the report.

It is of interest that in both the clinical and the experimental reports inflammatory reactions in nearly all instances were preceded by much larger doses of radiation than our patients received. Thus of 16 patients cited by Warren and Spencer<sup>5</sup> with definite pulmonary reactions (immediate and late) to irradiation only 1 patient had less than 1,000 roentgens and only 3 had less than 3,000. By contrast, the acute reaction in our case 1 developed after only 204 roentgens had been given anteriorly and 410 posteriorly. In case 2, 1,312 roentgens anteriorly and 962 posteriorly had been given with apparent impunity prior to the series immediately preceding the acute reaction, and in case 3 an unknown amount of radiation had been given about six years previously without untoward effect. Warren and Spencer<sup>5</sup> stated: "The amount of radiation necessary to produce histologic reaction varies greatly, although in most instances heavy dosage is required. This, together with variations in time and rate at which treatment is given, and the size of portal, suggests that there are factors other than irradiation alone concerned . . ."

#### SUMMARY

The acute reaction occurring in 3 patients with thyrotoxicosis during or shortly after irradiation of the thyroid area and upper mediastinum was similar in all three cases. Its principal features included the acute onset of precordial and retrosternal pain aggravated by thoracic movement and accompanied by fever, leukocytosis (in 2 cases), transitory auricular fibrillation

2. Rose, Edward; Wood, F. C., and Margolies, Alexander: *The Heart in Thyroid Disease*, 11. The Effect of Thyroidectomy on the Electrocardiogram, *J. Clin. Investigation* 15: 497 (July) 1935.

3. Groover, T. A.; Christie, A. C., and Merritt, E. A.: Observations on the Use of Copper Filter in Roentgen Treatment of Deep-Seated Malignancies, *South. M. J.* 15: 440 (June) 1922. Hsieh, C. K., and Kim, H. T.: Changes in Lungs and Pleura Following Irradiation for Extrathoracic Tumors, *Am. J. Roentgenol.* 37: 892 (June) 1937. Hartman, Bolliger, Doubt and Smith,<sup>7</sup> Warthin and Pohle,<sup>6</sup> Desjardins,<sup>4</sup> Warren and Spencer.<sup>5</sup>

4. Desjardins, A. U.: Action of Roentgen Rays and Radium on the Heart and Lungs, *Am. J. Roentgenol.* 28: 699 (Nov.) 1932.

5. Warren, Shields, and Spencer, Jack: Radiation Reaction in the Lung, *Am. J. Roentgenol.* 42: 682 (May) 1940.

6. Warthin, A. S., and Pohle, E. A.: Effect of Roentgen Rays on the Heart, *Arch. Int. Med.* 43: 15 (Jan.) 1929.

7. Hartman, F. W.; Bolliger, Adolph; Doubt, H. P., and Smith, F. J: Heart Lesions Produced by Deep X-Ray, *Bull. Johns Hopkins Hosp.* 11: 36 (July) 1927.

8. Strasser, cited by Desjardins.<sup>4</sup>

(in 2 cases) and electrocardiographic changes of the type associated with acute pericarditis. Significant physical signs were absent or questionable. The acute phenomena subsided in a few days, leaving no permanent sequelae. One case was complicated by probable acute iodism.

255 South Seventeenth Street.

## ADVANTAGES OF PROTAMINE ZINC INSULIN

RESULTS IN DIABETES COMPLICATED BY  
TUBERCULOSIS

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When diabetes and tuberculosis coexist, the tuberculosis nearly always follows on the diabetes, thus making it evident that diabetes predisposes to tuberculosis.<sup>1</sup> The onset of tuberculosis in persons with diabetes is hastened and favored if the diabetes is not properly managed, and it is believed that persons with controlled diabetes are no more liable to have pulmonary tuberculosis than nondiabetic subjects.

The successful treatment of tuberculosis in the diabetic patient is impossible without regulation of the diabetes. We have witnessed the doom of many persons with tuberculosis and diabetes, especially in preinsulin days, when they entered sanatoriums that specialized in the treatment of tuberculosis but scoffed at the necessity for any attention to the diabetes. The satisfactory adjustment of the diabetes makes it possible to achieve the same results with the tuberculosis in the diabetic as in the nondiabetic patient.<sup>1</sup> Since the utmost results for the cure of pulmonary tuberculosis appear to be achieved when the diabetes is well controlled, it seemed worth while to check on the comparative effects of protamine zinc insulin and regular insulin on the clinical course of tuberculosis when it was complicated by diabetes.

The term control of diabetes is usually employed as though it had a set meaning and that its criteria were fixed. The generally accepted conception of what makes the ideal regulation of diabetes is based largely on the existing ingrained deference to normality, that is, averages in persons who are regarded as healthy. The pattern for control of diabetes that has been conventionally set up until recently has been absence of sugar in the urine, freedom from acidosis, a normal level of blood sugar and a moderate degree of underweight.

The perfect standard of control for diabetes is necessarily in a state of flux depending on the facts that are brought to light from time to time by laboratory research on carbohydrate metabolism and by clinical observation of patients with diabetes.

The first tradition to be set aside was the acknowledgment that an elevation of blood sugar in the absence of glycosuria is not only harmless but even beneficial, because hyperglycemia promotes the utilization of sugar, does not predispose to infections, does not cause degenerative changes in the tissues and in fact is the rule in elderly (nondiabetic) human beings.<sup>2</sup> The confessed necessity for obtaining a twenty-four hour blood sugar curve to be certain that dextrose persists in the blood within a normal range makes it obvious that any physician who claims that the blood sugar is maintained within conventional accord because the blood sugar in a fasting patient is at a satisfactory level is fooling not only himself but all his patients and co-workers.

Numerous clinical observations have been made that small amounts of sugar in the urine while a patient is under the influence of protamine zinc insulin does no harm. This is a direct contradiction of what was believed to hold true when regular insulin was the only insulin available. Wilder<sup>3</sup> has offered an explanation of this paradox by demonstrating that in cases of severe diabetes intermittent periods of destruction of protein and loss of nitrogen occur when regular insulin is injected at the customary intervals throughout the day, whereas tissue loss ceases with the employment of protamine zinc insulin, which is effective for more than twenty-four hours and thus results in constant abatement of some, at least, of the inroads entailed by the uncurbed metabolic disturbance of diabetes. Tolstoi<sup>4</sup> has advanced further along these lines by showing that even great degrees of glycosuria are not accompanied by loss of nitrogen and, for a period of one year at least, diabetic patients under the influence of protamine zinc insulin have not been adversely affected in any way by such losses of sugar in the urine.

Whether or not glycosuria, of slight or of great degree, is innocuous when persisting over a period of years is something we cannot be certain about for some time to come. Most physicians feel more satisfied with the results of treatment and more secure about the condition of their patients when the urine contains little or no sugar. On the other hand, if hypoglycemic reactions, which often entail considerable temporary and at times permanent impairments, can be avoided by the feeding of extra amounts of carbohydrates, especially at night and before exercise, the risks of glycosuria are decidedly less than the hazards of hypoglycemia.

It is the general impression (one can go no further than that), which we share, that ketonuria, diabetic coma and gangrene and infection of the lower extremities occur less frequently since protamine zinc insulin has become generally used.

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This work was aided by a grant from the New York Diabetes Association, Inc.

### 1. References include:

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- Wiener, J. J., and Kavec, J.: Pulmonary Tuberculosis and Diabetes Mellitus, *ibid.* 34: 179 (Aug.) 1936.

2. Bayne-Jones, Stanhope: The Effects of Carbohydrates on Bacterial Growth and Development of Infection, *Bull. New York Acad. Med.* 12: 278 (May) 1936. Himwich, H. E.: Blood Sugar in Experimental Diabetes, *ibid.* 12: 284 (May) 1936. Tolstoi, Edward: Blood Sugar in Diabetes Mellitus, *ibid.* 12: 295 (May) 1936. Mosenthal, H. O.: Hyperglycemia: Evaluation in Treatment of Diabetes Mellitus, *J. A. M. A.* 105: 484 (Aug. 7) 1935.

3. Wilder, R. M.: Clinical Investigations of Insulins with Prolonged Activity, *Ann. Int. Med.* 11: 13 (July) 1937.

4. Tolstoi, Edward, and Weber, F. C., Jr.: Protamine Zinc Insulin: A Clinical Study; Report of a Group of Diabetic Patients in Whose Cases Glycosuria Was Disregarded for One Year, *Arch. Int. Med.* 66: 670 (Sept.) 1940.

Finally, protamine zinc insulin minimizes nervous tension for the patient, since it is administered only once a day, and not a single meal need be taken on schedule time or hurried within a given number of minutes after an injection, which often has to be taken under improvised, more or less exposed and trying conditions when therapy with regular insulin is used.

For all these reasons it was thought pertinent that a study of the comparative results obtained with protamine zinc insulin and with regular insulin in the treatment of diabetes complicated by tuberculosis should be undertaken.

The present study was carried out on 349 patients with diabetes complicated by tuberculosis treated at the Sea View Hospital from 1934 to 1939 inclusive. The diabetes of 71 patients was successfully controlled by diet alone, leaving 278 cases in which the effect of protamine zinc insulin and of regular insulin could be compared. Regular insulin was used exclusively in 131 and protamine zinc insulin alone or combined with regular insulin in 147 cases. Since the introduction of protamine zinc insulin in 1936, nearly all patients have been treated with this insulin.

The status of the tuberculosis on discharge from the hospital was determined for the patients given protamine zinc insulin and compared with that of those given regular insulin. Data on all patients receiving insulin are included in table 1. The figures indicate that protamine zinc insulin has a more favorable influence on the clinical course of tuberculosis than has regular insulin. Of the 147 patients receiving protamine zinc insulin the tuberculosis became arrested or apparently arrested in 22.4 per cent, showed improvement in 6.1 per cent, remained stationary in 22.5 per cent, progressed in 30.6 per cent and resulted in death in 18.4 per cent, while in the 131 treated with regular insulin the tuberculosis was arrested or apparently arrested in 13 per cent, remained stationary in 9.1 per cent and progressed in 33.6 per cent, and 44.3 per cent of the patients died.

A number of patients died or left the hospital within a few months after admission, making the period of observation somewhat brief for an evaluation of the

TABLE 1.—Comparison of Clinical Course of Tuberculosis in Persons with Diabetes Treated with Protamine Zinc Insulin or with Regular Insulin, Including all Cases Regardless of the Duration of Insulin Therapy

Status of Tuberculosis at End of Hospital Stay	Regular Insulin		Protamine Zinc Insulin	
	Number	Per Cent	Number	Per Cent
Total cases.....	131		147	
Arrested cases.....	0	0	5	3.4
Apparently arrested cases.....	17	13.0	23	15.6
Regressive cases.....	0	0	9	6.1
Stationary cases.....	12	9.1	33	22.5
Progressive cases.....	44	33.6	45	30.6
Deaths.....	58	44.3	27	18.4

effect on tuberculosis of either type of insulin. Such cases are omitted from table 2, and only those in which protamine zinc insulin or regular insulin has been received for more than six months are included. The data here again show that protamine zinc insulin has a distinctly more favorable influence on the course of the tuberculosis than does regular insulin. The tuberculosis became arrested or apparently arrested in 32.5 per cent of the patients treated with protamine zinc

insulin compared to 21.9 per cent of the patients given regular insulin; progression of the disease or a fatal termination occurred in 28.9 per cent of the group given protamine zinc insulin, while 73.4 per cent of those given regular insulin showed an unfavorable clinical course.

The conclusion that protamine zinc insulin was more efficacious than regular insulin might be questioned on several points. Among these are the degree of tuber-

TABLE 2.—Comparison of Clinical Course of Tuberculosis When Treatment with Protamine Zinc or Regular Insulin Was of More Than Six Months' Duration

Status of Tuberculosis at End of Hospital Stay	Regular Insulin		Protamine Zinc Insulin	
	Number	Per Cent	Number	Per Cent
Total cases.....	64		83	
Arrested cases.....	0	0	5	6.0
Apparently arrested cases.....	14	21.9	22	26.5
Regressive cases.....	0	0	9	10.9
Stationary cases.....	3	4.7	23	27.7
Progressive cases.....	19	29.7	17	20.5
Deaths.....	28	43.7	7	8.4

culosis on admission, the type of therapy accorded the pulmonary disease and the selection of patients in the two groups. No special choice of patients was made for the administration of protamine zinc insulin or of regular insulin. Since the latter part of 1936 nearly all patients requiring insulin were given protamine zinc insulin, whereas previous to that time regular insulin was in routine use; hence the factor of insulin grouping of the patients is eliminated. The grade of the tuberculosis on admission would affect the clinical course; however the stage of the tuberculous process on admission was essentially the same for the two groups. Of the patients receiving protamine zinc insulin for more than six months, 7.3 per cent had a minimal lesion on admission and 39.7 per cent moderately advanced disease, and 53 per cent far advanced disease, while in the group given regular insulin 10.9 per cent had minimal, 34.4 per cent moderately advanced and 54.7 per cent far advanced tuberculosis when they entered the hospital. Variation in the type of treatment for tuberculosis might account for the better results with protamine zinc insulin, but at Sea View Hospital the form of treatment had not appreciably changed since 1934. In support of this is the fact that surgical measures had been used in 56 per cent of the group given protamine zinc insulin and in 53 per cent of those given regular insulin, though the latter were largely those in the hospital prior to 1937 and the patients given protamine zinc insulin after that time.

#### SUMMARY

Since protamine zinc insulin exerts a more effective control of diabetes mellitus than regular or unmodified insulin, it was thought possible that in cases of diabetes complicated by tuberculosis the tuberculosis might be favorably influenced by protamine zinc insulin compared to unmodified or regular insulin. The records of Sea View Hospital reveal that in 349 patients with diabetes complicated by tuberculosis treated from 1934 to 1939 inclusive, of whom 274 received insulin, the clinical course of the tuberculosis was distinctly more favorable with protamine zinc insulin than with unmodified or regular insulin.

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PREPARATION AND TRANSFUSION OF  
SAFE UNIVERSAL BLOOD

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The use of blood belonging to group O as "universal blood" has been practiced for many years. With the rapid increase of the number of transfusions, it has become evident that the transfusion of universal blood is not as safe a procedure as was originally believed. The blood cells of group O cannot be responsible for reactions following a transfusion of universal blood because, with rare exceptions, they are not agglutinated by any kind of human serum at body temperature. The reactions obtained are attributed by many authors to the blood plasma of the donor containing the isoagglutinins anti-A ( $\alpha$ ) and anti-B ( $\beta$ ). In the majority of cases the titer of these agglutinins is not high enough to cause trouble, but in some instances the titer may be high or even extremely high. Cases have been reported in which there are titers occasionally reaching 500 and more. Justification for the administration of universal blood is based on the fact that the blood fluid of the donor's blood will be diluted sufficiently by the blood fluid of the patient to render ineffective the isoagglutinins present in the donor's blood. It is obvious that the dilution factor in high titered O bloods is not sufficient to prevent reactions.

Recently an amendment to the Sanitary Code of the State of New York was adopted by the Public Health Council (June 26, 1940) requiring group O blood to be titrated before it is used as universal blood in order to avoid so-called dangerous universal blood with a high titer of isoagglutinins. There are a number of reports in the literature referring to this dangerous universal blood. The most elaborate analysis of the question was carried out by Gesse,<sup>1</sup> director of the Institute for Blood Transfusion in Leningrad, whose work on hemolytic shock after blood transfusion was the subject of an editorial in *THE JOURNAL*.<sup>2</sup> Gesse described 46 cases of hemolytic shock following the transfusion of universal blood, 20 of which caused death of the patient. On the basis of his investigations Gesse formulated the following three postulates:

1. Not more than 100 to 200 cc. of universal blood should be transfused.
2. The number of erythrocytes and the hemoglobin content in the blood of the recipient must be determined. Transfusion of universal blood is permissible if the number of erythrocytes is above 2 millions.
3. The titer of the donor's blood serum toward the erythrocytes of the recipient must be determined. Only the blood of a universal donor with a titer of 1:8 to 1:16 can be used.

Even if these three postulates are kept in mind, Gesse warns against the use of the blood of a universal donor unless, in a case of real emergency, homologous blood is not available. He opposes the use of universal blood on a large scale under wartime conditions. He points

to the fact that even if hemolysis is not demonstrable after the transfusion of universal blood into a patient with A or B blood, definite signs of reactions are observed on the part of the nervous system and the cardiovascular system, particularly in regard to the pulse rate.

While it is not within the scope of this article to discuss the advantages and disadvantages of using universal donor's blood in transfusions, the question arises whether it would be possible to develop a procedure which would reduce the reactions following the transfusion of universal blood. More specifically, the problem consists in the elimination of the interaction between the isoagglutinins of the donor's blood and the isoagglutinogens of the patient's cells. Antibodies are best neutralized by the addition of the homologous antigen. A complex carbohydrate-like substance plays an important part in the composition of the so-called group-specific substance A, according to investigations carried out during recent years,<sup>3</sup> particularly by Landsteiner and his co-workers.<sup>4</sup> Convenient sources for the isolation of group-specific substance A are commercial pepsin, mucin and peptone.<sup>5</sup> In a previous paper we<sup>6</sup> reported observations on transfusions of group O blood to which a few milligrams of the isolated A-specific substance had been added. The addition of 25 mg. of A-specific substance to 500 cc. of group O blood reduces the titer of the isoagglutinin anti-A considerably or, at times, even completely. The transfusion of such blood into patients with blood belonging to group A proved to be satisfactory.<sup>6</sup>

In order to obtain really "safe" universal blood not only the isoagglutinin anti-A but also the isoagglutinin anti-B had to be neutralized. While studies of the A-specific substance had revealed its nature some time before, conclusive data were not available regarding the B property. After a number of ineffective attempts to isolate the B factor from blood and tissue from various sources, the B substance was finally isolated from the gastric juice of human beings belonging to group B.<sup>7</sup> The B substance is a carbohydrate-like substance chemically similar to the A-specific substance and also similar to the complex carbohydrates which are recognized as the bearers of the type specificity of pneumococci and other organisms.

After the A-specific and B-specific substances were made available, transfusions were performed with universal blood in which both isoagglutinins anti-A and anti-B were treated with their homologous antigens. The procedure itself is carried out in the following manner:

A 1:1,000 stock solution of group-specific substances is prepared. Twenty-five cc. of stock solution of A substance and 10 cc. of stock solution of B substance are kept in vaccine bottles under sterile conditions and

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1. Gesse, E. R.: Ueber die Verwendung des sogenannten Universal-spenders bei der Bluttransfusion, *Deutsche Ztschr. f. Chir.* 245: 371, 1935.

2. Hemolytic Shock After Blood Transfusion, editorial, *J. A. M. A.* 106: 2241 (June 27) 1936.

added to 500 cc. of citrated blood of group O at least five minutes previous to the administration of the blood. It is obvious that the substances could be added to the citrated solution before blood is collected. Somewhat less B substance than A substance has been used because (1) in many instances the anti-B factor in group O blood is weaker than the anti-A factor and (2) there is occasionally a slight reduction of the anti-B factor to be observed by the addition of the A substance, apparently caused by some kind of cross reaction between the A and B substances.

The group-specific substances combine rapidly with the proved by experiments in vitro. of the procedure is demonstrated by comparison of the donor's plasma before and after the addition of the group-specific substances. A few cubic centimeters of blood is taken out of the flask containing 500 cc. of citrated blood of group O. Plasma of blood of group O contains the isoagglutinins anti-A and anti-B. Their strength is determined by mixing serial dilutions of the plasma with human red

tion, while others observe agglutination on slides. Centrifugation of the test tubes increases the degree of agglutination.

So far group O blood that has been conditioned by the addition of A and B substances has been used in forty transfusions. In some instances only the A-specific substance and in other instances only the B-specific substance was added when patients known to have blood of group A or B respectively were treated. About half of the transfusions given contained A and B substances combined. Some of the patients received several transfusions at intervals of ten days to three weeks. No reactions were observed which could be attributed to the administration of group O blood conditioned in the way described or to the effectiveness of the isoagglutinins present in group O blood. It is obvious that the percentage of minor reactions following transfusions is not influenced at all by this procedure. A rise in temperature and urticaria may occur just the same as if untreated blood had been used. Reactions caused by overloading of the circulation or faulty technic certainly are not influenced at all by the neutralization of the anti-A and the anti-B factors in group O blood. The only accomplishment resulting from the addition of A and B substances consists in the neutralization of the possible effect of the anti-A and anti-B factors in group O blood. It is understood that blood of group O exclusively must be used as universal blood and not blood of different blood groups. While it seems to be possible to influence the isoagglutinins present in the blood fluids by the addition of the group-specific substances, it is not possible to change the cell properties A and B present in the blood cells themselves.

COMMENT

The A and B specific substances referred to in this paper are carbohydrate-like structures similar to those isolated from pneumococci and other micro-organisms. These substances are referred to as "haptens" because they usually do not stimulate the production of antibodies when injected intravenously into rabbits. A detailed report on this phase of the investigation will be published elsewhere.

It is interesting to observe that the addition of group-specific substances to normal human serum containing the respective isoagglutinins does not result in precipitation. In order to demonstrate the potency of group-specific substances toward normal isoagglutinins the method of inhibition of agglutination may be applied. This method consists in mixing decreasing amounts of group-specific substances with a constant amount of normal serum containing the respective isoagglutinin anti-A or anti-B. If, for instance, the A substance is mixed with serum containing the anti-A factor an almost immediate combination occurs resulting in neutralization of the anti-A agglutinin as well as of the isolysin anti-A. The degree of that neutralization can be determined quantitatively. The fact that these antibodies have been neutralized is demonstrated by subsequent addition of the A and B cells respectively. There is no agglutination if the isoagglutinins have been neutralized. By means of this test it can be shown that dilutions up to one in several millions may exhibit definite neutralizing effect.

The group-specific substances are protein free. One per cent solutions, when tested with sulfosalicylic acid, do not show any trace of protein. The Molisch reaction in a 1:1,000 dilution is strongly positive, and the products of hydrolysis in acid solution display a high percentage of reducing substances.

Agglutination of Human Red Blood Cells of Group A and Group B Respectively by Plasma of Group O

Test	Dilution of Plasma	Part 1 Before the Addition of Group-Specific Substances		Part 2 After the Addition of Group-Specific Substances	
		Group A Cells	Group B Cells	Group A Cells	Group B Cells
1	Undiluted.....	++++	++++	++	+
2	1:2.....	++++	++++	+	—
3	1:4.....	++++	++++	—	—
4	1:8.....	++++	+++	—	—
5	1:16.....	+++	+++	—	—
6	1:32.....	++	++	—	—
7	1:64.....	++	+	—	—
8	1:128.....	+	+	—	—
9	1:256.....	+	—	—	—
10	1:512.....	—	—	—	—
11	1:1,024.....	—	—	—	—
12	Saline control.....	—	—	—	—

Symbols: — = no agglutination; + = slight agglutination; ++ = moderate agglutination; +++ = strong agglutination, and ++++ = very strong agglutination.

cells belonging to group A and group B respectively. The A-specific and B-specific substances are added before the transfusion is started. The last 5 cc. of blood is collected in a test tube, and the plasma of this specimen is compared with that obtained before the addition of the group-specific substances. A typical experiment is here described:

Decreasing amounts of plasma (volume 0.2 cc.) [part 1, collected before the addition of the group-specific substances, and part 2, collected after the addition of the group-specific substances] are mixed with 0.2 cc. each of a 1 per cent suspension of human red blood cells belonging to group A and group B respectively. After standing for ten minutes at room temperature the tubes are centrifuged for about one minute. The resulting agglutination is recorded in the accompanying table.

The table shows that the plasma of this "universal blood" agglutinates A cells in dilutions up to 1:256 and B cells in dilutions up to 1:128. The addition of the group-specific substances results in a reduction of the agglutinating potency of the plasma to 1:2 and 1:1 respectively. It should be stated in this connection that there has been no general agreement reached as yet as to the method and technic of determining the titer of isoagglutinins. Some workers prefer to keep the tubes at room temperature without centrifuga-

## SUMMARY AND CONCLUSIONS

The addition of the isolated group-specific substances A and B leads to a reduction in strength or even elimination of the antibodies anti-A and anti-B present in the so-called universal blood of group O. These group-specific substances, carbohydrate-like in nature, can be added to the blood either before or after collection. Universal blood conditioned in the manner described can be given to any patient independently of the blood group to which he belongs without the necessity of previous determination of the patient's blood group and in emergencies even without cross matching. This blood, when kept in blood banks, is available for immediate use. When it is employed exclusively for all transfusions, no possible mix-ups with blood of different blood groups can occur, one of the main causes of fatalities from transfusion even in the most carefully conducted and supervised laboratories.

Serious objections against the indiscriminate use of universal blood have been raised by a number of investigators, some of them even warning against its use on a large scale in time of war. By eliminating the main objection, namely the possible interference of the isoagglutinins anti-A and anti-B with the A and B cell properties of the patients, such "safe" blood of group O may be considered a "universal" blood. It is obvious that the group-specific substances can also be used advantageously in the reduction of the anti-A and anti-B factors in plasma and serum when indicated.

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## URTICARIA DUE TO ALIPHATIC ALDEHYDES

## A CLINICAL AND EXPERIMENTAL STUDY

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A survey of the literature does not reveal a report of allergy to aldehydes other than formaldehyde. While specific hypersensitivity to solution of formaldehyde either in a free state or as a condensation product in plastics is well recognized and not rare, only 1 such case has ever been studied experimentally. Horsfall<sup>1</sup> in 1934 made a thorough immunologic study of a patient specifically sensitive to formaldehyde. This patient, unlike the one concerned in this study, reacted to formaldehyde only and not to any other homologous aliphatic aldehyde. Horsfall obtained positive cutaneous reactions by the intracutaneous injection not only of formaldehyde (1:8,000,000) but also of various heterologous proteins treated with formaldehyde. A reaction was not obtained with control injections of the proteins not treated with formaldehyde. Despite these specific cutaneous reactions with formaldehyde and proteins treated with formaldehyde, passive transfer antibodies could not be demonstrated in this study.

From the Departments of Medicine and Physiological Chemistry, University of Illinois College of Medicine.

Dr. C. D. Hurd of the Department of Organic Chemistry, Northwestern University, gave valuable advice and supplied some of the rarer compounds; Drs. W. H. Welker, A. G. Cole and Cecil C. Harvey of the Physiological Chemistry Department, University of Illinois College of Medicine, gave valuable advice.

1. Horsfall, F. L., Jr.: Formaldehyde Hypersensitivity: An Experimental Study, *J. Immunol.* 27: 569-581 (Dec.) 1934.

## REPORT OF CASE

*History.*—A white man aged 27 reported to the allergy clinic of the Research and Educational Hospital, University of Illinois College of Medicine, in July 1937 after a tentative diagnosis of urticaria had been made in the dermatology department of the same institution. The symptoms had first appeared early in July. The patient stated that the onset was gradual, with itching and burning, followed by the appearance of small lesions on the terminal phalanges of the second and third fingers of the right hand and swelling of the upper or lower lip several times a day for about one week. Following the week of onset the lesions became generalized, appearing, in the main, during the evening and night. Sleep became almost impossible. The hives were typical, universal in distribution, pinpoint to giant size (1 to 60 cm. in diameter).

Prior to this time the patient had enjoyed normal health. He had been engaged for the previous four years as a research worker in histology and at the same time completed a course in dentistry. He had always been actively engaged in athletics. In the past he had shown no dermatologic disturbances or allergic manifestations.

The father, mother, two brothers and three sisters are all living and in good health. The father had attacks of asthma for two years prior to the birth of the patient. The cause of the asthma was attributed to dye vapors which he encountered as an employee in the fur dyeing industry. When he changed his vocation, the asthmatic condition disappeared.

*Physical Examination.*—This was essentially negative except for dermatographia. A mild phyto dermatosis between the toes on both feet was detected. Treatment with a salicylic acid ointment for two weeks caused this to disappear, but the hives persisted.

*Allergic Study.*—Intracutaneous tests were done with food and environmental substances while other allergic studies were being carried out. Positive cutaneous reactions were obtained with the following: garlic (questionable); 1 plus reactions with banana, hops, cabbage, blackberry, peanut, cocoa, olive, cantaloupe; 2 plus to 4 plus with pea, tea, carrot (well defined), parsnip (very well defined), blueberry, orris root, pyrethrum (well defined). These reactions seemed unrelated to the hives, since the complete elimination of the substances involved caused no change in the condition. It will be noted, however, in the discussion later, that the positive cutaneous reactions may not be without significance in relation to the actual causes of symptoms.

It was early suspected that formaldehyde might be the cause for the patient's urticaria because of his daily contact with it in his work. However, a vacation of two weeks, during which time the patient carefully avoided histologic laboratories or contact with any formaldehyde, failed to bring relief. Because of the constant presence of hives during the first five months of the ailment, it was impossible to study the clinical effect of exposure to formaldehyde or to any other suspected substance.

Dietary studies rigidly carried out for weeks likewise failed to produce benefit. Because of his well nourished condition and the severity of the symptoms, the patient submitted to a starvation period of one week during which time he took only water and rye crackers, without improvement. Elimination of rye was likewise without effect. The effect of removal of various environmental factors by having the patient sleep in a bare room on a canvas cot likewise failed to affect the condition. Physical factors were also ruled out as a cause of his urticaria. Neither heat nor cold influenced the condition.

During the fifteen months that the symptoms persisted the study was continued. No focus of infection was found. Because of the presence of epigastric distress, gastrointestinal studies, including roentgen and stool examinations, were made and found negative except for the presence of hypochlorhydria. The basal metabolism rate was normal. The therapeutic measures that were used to give relief were of little benefit. Hydrochloric acid given orally and intravenously (15 cc. of a 0.05 per cent solution for one week), the daily use of histamine by injection and calcium lactate intravenously produced no improve-

ment. Some relief from itching was obtained by using potassium chloride (30 to 100 grains [2 to 6.5 Gm.] daily by mouth) and an "acid ash" diet. Injections of splenic extract likewise gave relief from itching. The most reliable therapeutic agent for the relief of itching, discovered by the patient, was 1 ounce (30 cc.) of whisky taken four times a day. This proved to be about as effective and more pleasant than frequent injections of solution of epinephrine hydrochloride.

TABLE 1.—*The Effect of Formaldehyde Through Gastric and Through Intestinal Absorption*

Dilution	Enteric Coated Capsules *			Gelatin Capsules *		
	Symptoms		Time Between Taking Capsule and Onset of Symptoms	Symptoms		Time Between Taking Capsule and Onset of Symptoms
	Flushed Face	Flushed Face and Hives		Flushed Face	Flushed Face and Hives	
1:1,000,000	..	..	.....	..	..	.....
1:100,000	..	..	.....	..	..	18 minutes
1:10,000	..	..	.....	..	..	15 minutes
1:1,000	+	±	4 hours, 20 minutes	+	+	15 minutes
1:100	++	++	4 hours, 15 minutes	++	+++	22 minutes, flushed face in 10 minutes
1:10	++	+++	4 hours, 50 minutes	+++	+++	18 minutes, same

\* Twenty-four hours elapsed between successive tests.

† The hives persisted for two to three hours.

‡ The hives persisted intermittently for ten to fifteen hours—itching, restlessness and poor sleep.

During the fifteen month period of symptoms, the patient, a heavy cigaret smoker, was not instructed to abstain from smoking. When the history was reexamined it was noted that at the onset of the hives itching first appeared on the lips and on the fingers of the right hand. This suggested the possibility of cigaret smoking as a cause of the urticaria. To our surprise, the hives subsided completely when smoking was discontinued. To satisfy his own finding, the patient again tried his accustomed brand of cigarets. The hives reappeared after he smoked one or two cigarets. An inquiry from the leading manufacturers for the composition of their cigarets was answered by the statement that the formula was a "trade secret." However, because of the occurrence of hives with brands made by several different manufacturers, the inference was that the harmful agent was a common component of cigarets. Combustion products of glycerin were suspected. This was confirmed by the absence of hives after the patient smoked cigarets which contained diethylene glycol instead of glycerin as the hygroscopic agent. When, however, a small amount of glycerin was introduced with a toothpick into this cigaret, hives occurred after smoking. So sensitive was the patient at this time that during periods of freedom from symptoms hives would appear a few minutes after entering a smoke filled room, or even after shaking hands with some one who had been smoking cigarets shortly before.

On the basis of the known chemistry of the combustion of glycerin, it was suspected that acrolein,  $\text{CH}_2=\text{CH}\cdot\text{CHO}$ , a pungent and irritating unsaturated aldehyde, was responsible for the reaction. To check this, acrolein was prepared by heating glycerin in the presence of potassium bisulfate. The residue thus obtained was applied to the fingers or lips with a glass rod. Within fifteen minutes the patient broke out in generalized hives. This was further confirmed by the occurrence of hives after eating shallow fried or broiled foods, a process in which a variable amount of acrolein is produced through the oxidation of fat. Deep fried foods (probably because heating of these is less intense) did not produce urticaria. It was interesting to observe that while discomfort did not occur after a meal of boiled beef or fish, the same foods when broiled produced severe urticaria.

**Psychogenic Factors.**—The many fruitless attempts at an etiologic diagnosis during the long period of study often tempted us to attribute the urticaria to emotional disturbances. There was, however, no manifest reason to suspect any unusual emotional strain during the period of symptoms. Following the discovery of the relationship of the urticaria to acrolein

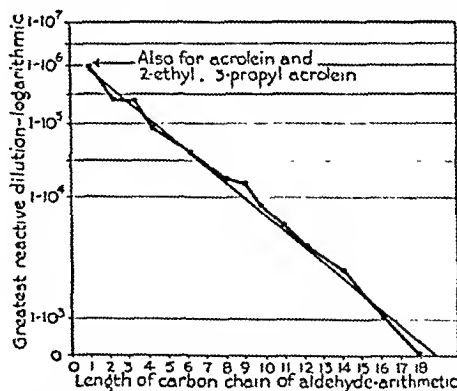
(and related aldehydes) the patient went through a prolonged period of severe stress, occasioned by the serious illness of his only child, without the recurrence of hives except when induced experimentally.

#### EXPERIMENTAL OBSERVATIONS

The discovery that the hives could be produced by acrolein again drew our attention to formaldehyde, the aldehyde first suspected as the cause of the hives. There was now a credible explanation for the failure of the hives to clear up when the patient was not in contact with formaldehyde. The use of solution of formaldehyde in the laboratory quickly demonstrated that this compound was also capable of producing in the patient a severe attack of urticaria. We therefore set out to study the effect on the patient of various aldehydes.

The purposes of the experiment were as follows: (1) to determine the effect of other aldehydes related to formaldehyde (aliphatic aldehydes), the concentration necessary for symptoms and the various sites of absorption; (2) to study the effect of unrelated aldehydes, i. e. the aromatic aldehydes; (3) to attempt to determine the effective part of the molecular structure in the production of symptoms.

**Experiments with Formaldehyde.**—Formaldehyde ( $\text{HCHO}$ ), the first of the series of aliphatic aldehydes, was used in our first studies. All the dilutions were by volume and on the basis of 100 per cent formaldehyde. One drop of a 1:1,000,000 solution of pure formaldehyde in water placed on the lip produced local urticaria of the lip in a few minutes, followed by mild generalized urticaria within ten minutes. To determine whether contact with the skin or mucous membranes was necessary for this effect, 0.02 cc. of a 1:10,000,000 solution of formaldehyde was injected intramuscularly. Contact with the skin or subcutaneous tissue was avoided by using a fine gage needle introduced through a larger bore needle which was first inserted into the biceps muscle. The inner needle was removed after the injection was completed and before the protecting sleeve was withdrawn. Urticaria occurred within thirty-five



Relation of straight chain aldehydes in their capacity to produce urticarial reaction.

minutes after this injection; first on the volar surfaces of the forearms and then on the neck and about the waistline.

To determine the effect of absorption from the gastrointestinal tract, the following tests with dilutions of formaldehyde were performed:

1. Dilutions on a volume basis of pure formaldehyde, ranging from 1:10 to 1:1,000,000, were prepared in gelatin capsules with lactose as a medium. Two sets of capsules were made for each dilution. One set was

enterically coated.<sup>2</sup> Care was taken that the patient did not expose himself to vapors or solution of formaldehyde for a period of two days preceding and during the test period. After ingestion of any single capsule, twenty-four hours was permitted to elapse before a subsequent trial was made. Table 1 shows the dilutions, trials and results in detail. Slight symptoms (flushed face) occurred with one drop of a 1:1,000 solution of formaldehyde in the gelatin capsules and definite urticaria with the 1:100 solution. With the enteric coated capsules a higher concentration of formaldehyde (1:100) was required for a definite reaction. It is interesting, in view of the effectiveness of the high dilution (one drop of a 1:1,000,000) placed on the lip, that a much higher concentration was necessary to produce urticaria by way of the gastrointestinal tract.

*Other Aliphatic Aldehydes.*—The effects of other aliphatic aldehydes up to a molecular chain of eighteen

TABLE 2.—Classification of Substances Used Experimentally: Negative Reaction with All Conjugated (Aromatic and Aliphatic) Aldehydes; Positive Reaction Only with Nonconjugated Aldehydes and Acrolein

Substances Tested	Classification	Urticarial Reaction	Time of Onset
Benzaldehyde.....	Aromatic (conjugated)	Negative	.....
Salicylic aldehyde.....	Aromatic (conjugated)	Negative	.....
Vanillin.....	Aromatic (conjugated)	Negative	.....
Furfural.....	Heterocyclic (conjugated)	Negative	.....
Sulfapyridine.....	Amo-amino-pyridine	Negative	.....
Allyl acetal (Hurd).....	Acetal	Negative	.....
Vinyl allyl ether* (Hurd) (CH <sub>2</sub> =CH—O—CH <sub>2</sub> —CH=CH <sub>2</sub> )	Ether	Negative	.....
Cinnamic aldehyde.....	Aromatic (conjugated)	Negative	.....
Crotonaldehyde.....	Aliphatic (conjugated)	Negative	.....
Citronellal.....	Aliphatic (non-conjugated)	Positive	20 minutes
Allylacetaldehyde (Hurd)	Aliphatic (non-conjugated)	Positive	Few minutes
Formaldehyde to 18th carbon aliphatic saturated aldehyde (and acrolein); see chart	All aliphatic, all nonconjugated (except acrolein, see text)	All positive	Seconds to minutes

\* This compound was tried because it easily hydrolyzes by action of hydrochloric acid to acetaldehyde.

carbon atoms were next studied. Serial dilutions up to 1:1,000,000 of the pure aldehydes were tested. Those below the octaldehyde were diluted in distilled water. Those with more than eight carbon atoms were first dissolved in an equal volume of 95 per cent alcohol before further dilutions were made with distilled water. A few drops of the dilution tried were applied to the lips with a glass applicator.

All simple, continuous chain aldehydes up to stearic aldehyde, C<sub>17</sub>H<sub>35</sub>CHO, produced an urticarial reaction. However, as the number of carbon atoms in the aldehyde molecule became greater, the concentration required to produce a reaction was proportionately greater (shown in the accompanying chart). Conversely, the shorter the carbon chain the more effective the aldehyde. The range of dilution ran from 1:1,000,000 for formaldehyde to 1:1 for the aldehyde containing 18 carbon atoms. Interestingly, the curve of concentrations required for a minimal reaction corresponds to the tendency of the solubility curve of these aldehydes. Horsfall<sup>1</sup> in his report suggests that the presence of formaldehyde in traces, as a contaminant in

the higher aldehydes, should be ruled out. The Collins-Hanzlik modification of the phloroglucinol test for free formaldehyde was carried out on higher aldehydes that gave a positive reaction. The result was negative in all cases. The test is sensitive for detection of formaldehyde in a dilution of 1:1,000,000.

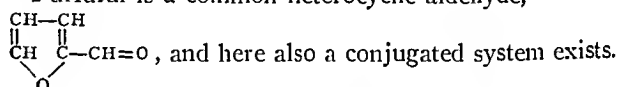
#### CONJUGATION VERSUS NONCONJUGATION

Early in the trials with the various aldehydes it was noted that certain aliphatic double bonded aldehydes and aromatic aldehydes such as benzaldehyde (table 2) did not produce urticaria. Furfural likewise gave a negative result. To investigate further these preliminary experiments, a series of aliphatic double bonded aldehydes and certain aromatic aldehydes were used after the patient had gone through a prolonged period of freedom from hives (table 2).

The results (table 2) showed no reaction with all the aldehydes of these two groups. Inquiry into the difference between the chemical behaviors of the non-reactive and the reactive aldehydes revealed that those failing to produce reactions possess conjugate unsaturation except in one case, namely acrolein, whereas those producing reactions are nonconjugated compounds.<sup>3</sup>

Since no conjugated aliphatic aldehyde except acrolein produced urticaria in this patient, while all nonconjugated aliphatic aldehydes produced urticaria, a possible explanation of this phenomenon presents itself. It is assumed that the effective aldehydes combine with somatic proteins producing addition products (the allergen) to which the person is sensitive. The aldehyde radical in the nonconjugated compound is free to react with the protein to form such addition products, whereas the conjugated aldehyde, because of its lessened aldehyde reactivity, is unable to initiate this process.

Furfural is a common heterocyclic aldehyde,



Furfural, like benzaldehyde, failed to give rise to any urticarial symptoms.

Allylacetaldehyde, CH<sub>2</sub>=CH—CH<sub>2</sub>—CH<sub>2</sub>—CH=O, was interesting to test because its two double bonds are not conjugated. This compound was found to display ordinary aldehydic reactivity when the patient was exposed to it. The onset of hives was produced in a few minutes.

Allyl acetal, CH<sub>3</sub>—CH(OCH<sub>2</sub>CH=CH<sub>2</sub>)<sub>2</sub>, is not an aldehyde but it possesses a potential aldehyde function, since it changes to acetaldehyde on hydrolysis with

3. The phenomenon of conjugation is described briefly as follows: "Organic compounds that contain alternate double bonds in their skeleton such as C=C—C=C or C=C—C=O are classed as conjugated. The former type is a diolefin and the latter is an α, β-unsaturated aldehyde. Compounds of this type are considered to resonate between several electronic structures, with the net result that the activity of the compounds is less than one would infer from the presence of the two double bonds alone.

"Butadiene, for example, may exist not only as CH<sub>2</sub>=CH—CH=CH<sub>2</sub> but also as  $\overset{+}{\text{CH}_2}-\text{CH}=\text{CH}-\overset{-}{\text{CH}_2}$  (unshared electrons represented by dots). This explains why, in reaction with bromine, the major product is 1,4-dibromo-2-butene, BrCH<sub>2</sub>—CH=CH—CH<sub>2</sub>Br.

"The simplest aldehyde with conjugate unsaturation is acrolein, CH<sub>2</sub>=CH—CH=O. Its resonance modification is  $\overset{+}{\text{CH}_2}-\text{CH}=\text{CH}-\overset{-}{\text{O}}$ .

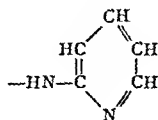
(All the unshared electrons are represented by dots. Each single bond represents two electrons, each double bond four electrons). Crotonaldehyde, CH<sub>3</sub>—CH=CH—CH=O, represents the next member of this conjugated family. Acrolein and crotonaldehyde differ significantly in their chemical reactivity. If pure, the former will resinify spontaneously, standing for a few minutes, whereas the latter exhibits no such tendency. In general, aldehydes with conjugate unsaturation possess the comparative stability of crotonaldehyde rather than the reactivity of acrolein. This correlates with the activity of acrolein alone among conjugated aldehydes as found in the present work" (C. D. Hurd, personal communication to the authors).

2. The enteric coated capsules were prepared by J. D. Searle & Co., Chicago.



acids. The compound was found to be ineffective in bringing about hives in the patient.

Sulfapyridine is not an aldehyde but its structure made it interesting to test, since the pyridine portion of the compound is substituted by nitrogen in the  $\alpha$  position:



The  $\begin{array}{c} \text{N} \\ \text{=C} \\ \text{NH} \end{array}$  portion of this compound resembles alde-

hydes in that two bonds from carbon pass to nitrogen, a negative atom like oxygen. In aldehydes or acetals, two bonds from carbon pass to oxygen. Although tests with sulfapyridine were also found to be negative in bringing on hives, it should be pointed out that the pyridine nucleus possesses conjugate unsaturation.

Results with the various compounds are summarized in table 2.

The results with the aromatic aldehydes (benzaldehyde, cinnamic aldehyde, salicylic aldehyde and vanillin), all of which failed to produce urticarial symptoms, lends further support to the application of conjugation and nonconjugation as an explanation for the presence or absence of reaction. The benzene ring is in itself a conjugate system because of the double bonds between alternate carbons of the ring, and the aldehyde group in the cases cited is conjugated with it. The aldehyde radical in such compounds is not free to react with proteins to produce the allergen to which the patient was sensitive.

#### COMMENT

The urticaria described lasted for fifteen months. The patient has been free from symptoms now since September 1938 except when hives have been experimentally produced. There is, therefore, no doubt of the causative factors. From a clinical point of view the study of this patient emphasized what experienced allergists so frequently underline—the importance of an intelligent, thorough history in the diagnosis of an allergic condition. In retrospect, the story of involvement of the fingers and lips at the onset should have immediately suggested some contact substance, as a cause. However, even this degree of diagnostic accuracy would not have sufficed. It is important to isolate the exact substance in the cigarettes, not for academic reasons but for practical purposes. Otherwise the patient, while avoiding cigarettes, would have continued to have urticaria from acrolein in fried and broiled foods, from formaldehyde in his occupation and from the many other aliphatic aldehydes found in many foods and commonly used essential oils.

In this connection we may now consider the possible significance of the positive cutaneous reactions found by intracutaneous tests in this patient. As previously mentioned, the elimination of the foods and environmental substances to which he reacted produced no change in his urticaria. While from a clinical point of view it is justifiable to assign no importance to such reactions in the absence of symptomatic improvement, it should be noted that most of the allergens previously listed contain in their volatile oils aliphatic aldehydes as well as other aldehydes which are partly responsible for their characteristic odor. Not only the foods but orris root and pyrethrum (pyrethric aldehyde) likewise

contain aliphatic aldehydes. It is possible that the positive cutaneous reactions obtained with these substances were due to the minute amounts of aliphatic aldehydes present in the extract. Some confirmation of this was obtained by the following experiment recently done on the patient. At this time he had been free of hives for two years and eight months except when attacks were experimentally induced: Concentrated extract of garlic 0.3 cc. was applied to the lips and was permitted to be swallowed. Within three minutes the lower lip began to itch. After five minutes the patient felt an uncomfortable "knotty" epigastric distress characteristic of his exposure to acrolein or other aldehydes. After ten minutes, itching of the face, neck, soles, waistline, arms and face was intense. This was followed in a few seconds by severe generalized urticaria and edema. Despite this severe reaction, garlic on intracutaneous testing (with 0.02 cc. of a 1:100 solution of this concentrated extract) had in the original examination given only a questionable reaction.

From an experimental point of view, the question arises whether acrolein formed in the preparation of fried and well broiled foods may not be a cause of specific hypersensitivity. Intolerance to fried foods with symptoms suggestive of gallbladder disease may in some cases be an expression of gastrointestinal allergy to acrolein rather than of organic involvement of the gallbladder. Is the "heart burn" complained of by smokers due in some cases to specific acrolein sensitivity or is it always due to the known primary irritating qualities of this aldehyde or of other combustion products? It is difficult to investigate these symptoms in the absence of objective signs. We have evidence in at least one other patient sensitive to solution of formaldehyde that inhalation of acrolein will produce a typical migraine headache. It is our plan in a future study to combine various aldehydes with serum protein to form a nonirritating allergen for cutaneous tests as one of the methods for studying "heart burn" from cigarettes and fried foods, precordial distress following cigaret smoking and other conditions which may possibly be due to aldehyde sensitivity.

#### SUMMARY AND CONCLUSIONS

1. A patient whose urticaria was of fifteen months' duration was found specifically sensitive to the aliphatic nonconjugated aldehydes ranging from formaldehyde to an eighteen chain aldehyde.
2. The aliphatic conjugated and the aromatic aldehydes failed to produce symptoms. The exception to this was acrolein, which, while structurally classified as a conjugated aldehyde, is sufficiently reactive to be grouped with the nonconjugated aldehydes.
3. The differences in the reactions with proteins of aromatic and conjugated aliphatic aldehydes as compared with the nonconjugated aliphatic aldehydes is offered as an explanation for the specific sensitivity of the patient to the last group and not to the first two groups of aldehydes.
4. Urticaria was produced with formaldehyde by contact with the unbroken skin, the lip, the stomach (gelatin coated capsules), the intestine (enteric coated capsules) and by intramuscular injection without immediate contact with the subcutaneous tissues. It is interesting that formaldehyde in gelatin coated capsules was more active than that in the enteric coated ones and that contact with the lip was more effective than either of these.

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## NEOARSPHENAMINE TO MANAGE COURSE OF FEVER IN THERA- PEUTIC MALARIA

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Recently Cole and his associates<sup>1</sup> reported on the results of injections of compounds of bismuth and other heavy metals with the object of enabling patients to recover from the effects of attacks of fever in therapeutic malaria. After a few days rest the attacks were allowed to continue till their number was deemed sufficient for the intended therapeutic effect.

In the Netherlands therapeutic malaria in the treatment of dementia paralytica has been applied since 1921. By the cooperation of the two psychiatric clinics in Amsterdam with the zoologic department of the Institute for Tropical Hygiene I have been enabled to keep

and neoarsphenamine. Since 1933, however, for various reasons, these strains no longer have been in use. (b) the Madagascar strain, received from England (Horton Mental Hospital, Epsom) in 1927. This strain differs from the foregoing ones in some respects, particularly as to their sensitivity to neoarsphenamine. The Madagascar strain is still in use for inoculation both by mosquito bites and by the injection of blood.

2. *Plasmodium malariae*: This strain, the causative agent of quartan malaria, was obtained from Vienna (Wagner von Jauregg's clinic) in 1933. It is used mainly for patients in whom, because of their immunity, a sufficient number of attacks of fever cannot be obtained with *P. vivax*. This strain can be transmitted only by the injection of blood, as infection by mosquitoes succeeds only exceptionally.<sup>2</sup> *P. malariae* is refractory to injections of neoarsphenamine.

The Amsterdam clinics, like many institutions in the United States,<sup>3</sup> do not apply therapeutic malaria only but combine this treatment with neoarsphenamine in the

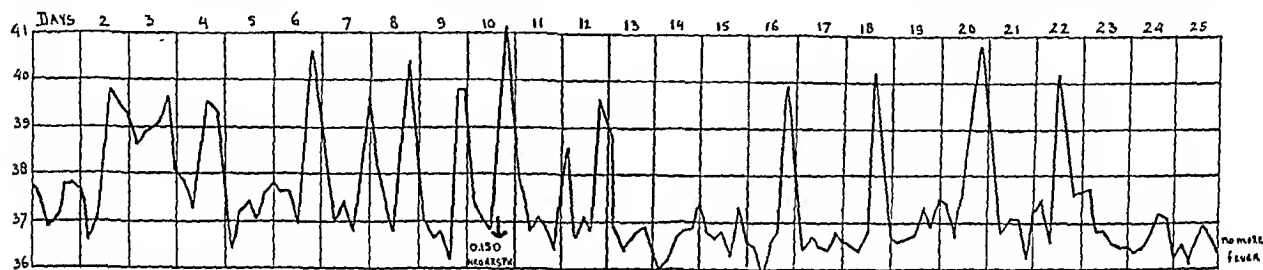


Chart 1.—Inoculation with *Plasmodium vivax*, Dutch strain, by injection of infected blood. On the tenth day neoarsphenamine, 0.15 Gm., was given intravenously because of double tertian fever. Result: Three afebrile days, followed by four chills of simple tertian fever. Spontaneous resistance. Patient was afebrile with numerous parasites in thick blood film.

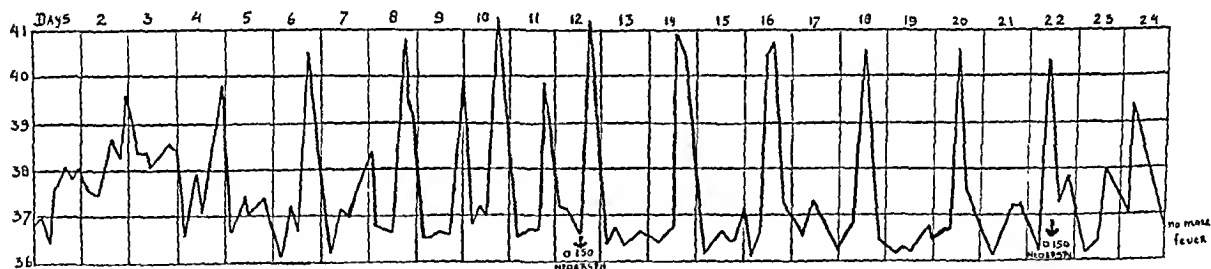


Chart 2.—Inoculation with *P. vivax*, Dutch strain, by injection of blood. On the twelfth day 0.15 Gm. of neoarsphenamine was given intravenously. Result: Simple tertian fever. On the twenty-second day 0.3 Gm. of neoarsphenamine was given intravenously. Result: Fever stopped after two days.

in stock the strains of plasmodia necessary for the treatment and to maintain a station for the breeding of mosquitoes, so that the inoculation of patients can be carried out both by mosquito bite and by the injection of infected blood. Furthermore, by this means all the other university clinics and hospitals for persons with mental disease in the country can be provided with material for infection by mosquitoes or by blood.

Since 1921 the following parasitic strains have been used in the Netherlands:

1. *Plasmodium vivax*: (a) several strains originating from patients in regions in which benign tertian malaria is endemic (the provinces of North Holland and Friesland). These strains show no difference whatever among themselves nor do they differ in their behavior in response to the usual chemotherapeutic agents quinine

usual increasing doses of 0.15, 0.3, 0.45 and 0.6 Gm. It soon appeared that neoarsphenamine has a double effect in the treatment of dementia paralytica, not only as an antisiphilitic drug but also in the management of the course of the fever in therapeutic malaria. The present study deals with the latter effect only.

It has been known for many years that neoarsphenamine is useful in the treatment of patients with benign tertian malaria. Its use, however, is limited, since arsphenamine derivatives alone cannot definitely control the infection. For the final elimination of the malarial parasite quinine is necessary. After inoculation by the injection of blood the infection is always completely controlled by a dose of 5 Gm. of quinine administered in the course of five days. With this method of inoculation relapses do not occur.

Read before the Netherlands Society of Tropical Medicine, Nov. 10, 1940.

1. Cole, H. N., and others: Use of Bismuth Injections to Manage Course of Therapeutic Malaria, *J. A. M. A.* 115:422 (Aug. 10) 1940.

2. de Buck, A.: Infection Experiments with Quartan Malaria, *Ann. Trop. Med.* 29:171 (July) 1935.

3. Leary, P. A., and others: Malaria and Artificial Fever in Treatment of Paresis, *J. A. M. A.* 115:677 (Aug. 31) 1940.

In cases of benign tertian malaria transmitted by mosquito bite, relapses do occur. As, however, by the large number of bouts of fever the patient acquires a high degree of immunity to the malarial infection, the number of clinical relapses is much lower than it is among other patients with malaria. Experience on this point obtained in the Netherlands is briefly summarized in table 1.

In view of these experiences in recent years the malaria course in the Amsterdam clinics, after inoculation both by injection of blood and by mosquito bite, has been cut short by a brief treatment with quinine for five to seven days.

Hardly any patient inoculated with *P. vivax* retains a tertian fever rhythm throughout the treatment, in the course of which the attacks of fever usually double in number and become quotidian. In some patients this occurs early in the series of attacks, in others only at the end. It is often deemed necessary to restore a tertian rhythm for the daily attacks. But even when the fever has preserved its simple type it may be desirable for clinical reasons (a tendency to collapse, general weakness, violent vomiting or incipient jaundice) to interrupt the fever for a few days.

For both purposes I inject a small dose of neoarsphenamine. Quinine is less suitable for these pur-

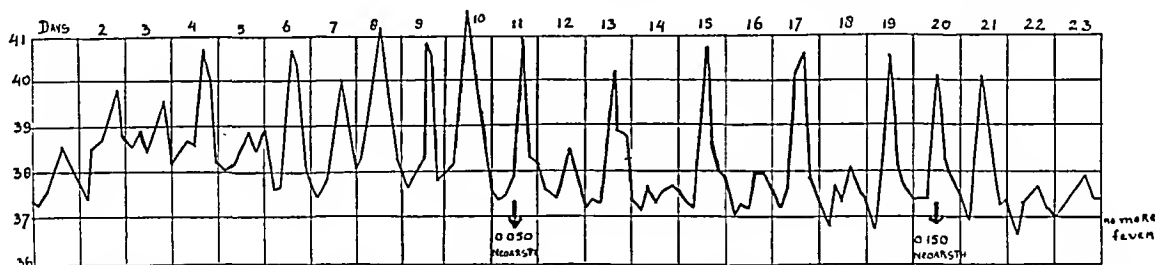


Chart 3.—Inoculation by mosquito bite with *P. vivax*, Madagascar strain. On the eleventh day 0.05 Gm. of neoarsphenamine was given intravenously because of double tertian fever. Result: Simple tertian fever. On the twentieth day 0.15 Gm. of neoarsphenamine was given intravenously. Result: Patient was afebrile after next day.

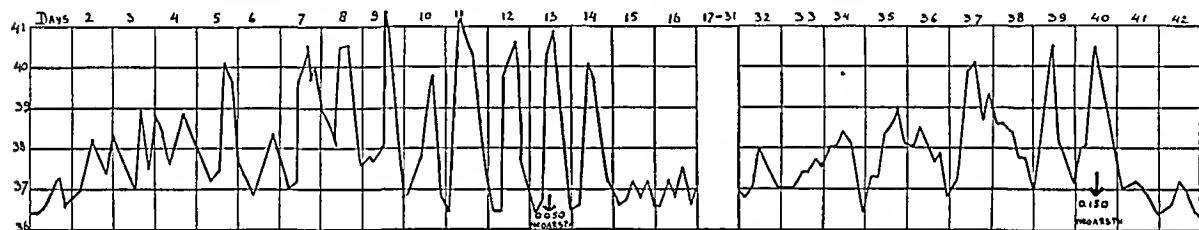


Chart 4.—Inoculation by mosquito bite with *P. vivax*, Madagascar strain. On the thirteenth day 0.05 Gm. of neoarsphenamine was given intravenously for double tertian fever. Result: Patient remained afebrile during three weeks, with numerous parasites in thick blood film.

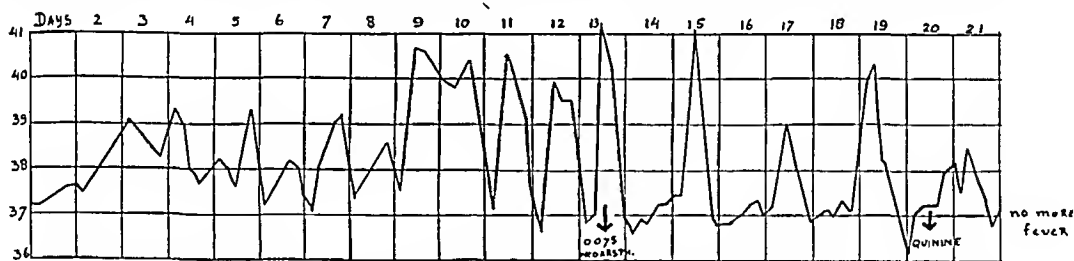


Chart 5.—Inoculation by mosquito bite with *P. vivax*, Madagascar strain. On the thirteenth day 0.075 Gm. of neoarsphenamine was given intravenously. Result: Simple tertian fever. On the twentieth day treatment with quinine was started.

The fact that neoarsphenamine suppresses benign tertian fever by a considerable reduction of the number of parasites in the peripheral blood is made use of to postpone the course of quinine until the antisymphilitic therapy with neoarsphenamine is altogether or nearly completed. In this way there is always blood available for inoculating fresh patients, even when there are no infected mosquitoes or febrile patients at hand, as after a one or two week pause in the neoarsphenamine treatment parasites are nearly always demonstrable in the peripheral blood. It is not necessary to wait until the patient becomes febrile again: In nonfebrile patients one often succeeds in demonstrating the parasites by the thick drop method, as long as no quinine has been taken.

A further application of neoarsphenamine is its use for managing the course of the fever.

poses, as its parasitocidal action is too strong, so that one obtains too long a remission, up to a few weeks.

In the course of several years I have obtained experiences with the Dutch strains of *P. vivax* as outlined in table 2 and have reached the following conclusions concerning these strains:

1. When the patient has double quotidian, an intravenous dose of 0.15 Gm. of neoarsphenamine applied after the attack of fever is as a rule sufficient to convert the duplicate fever into a simple (tertian) one. In one fourth of the cases there are first a few afebrile days. In about another 25 per cent the effect is insufficient; one can then repeat the dose after two to three days.

2. When one wants to interrupt the fever therapy for a few days in order to allow the patient to recuperate, an injection of 0.15 Gm. on an afebrile day is often sufficient for simple tertian fever. When this fails, one can repeat the dose after two to three days.

3. For the sake of definitely cutting short the fever therapy when one does not yet want to give quinine, a first injection of 0.15 Gm. of neoarsphenamine will often prove sufficient, but it is only after injecting 0.3 Gm., followed by the usual series (0.3, 0.45 and 0.6 Gm.) that one may feel sure of success. Treatment with quinine can then be given at the end of the course of neoarsphenamine.

series of neoarsphenamine injections is effective, beginning at 0.15 Gm. and increasing to 0.3, 0.45 and 0.6 Gm.

The effect of neoarsphenamine is clearly illustrated by the fever charts. These charts, like the tables, hardly need any comment. I want only to stress that the various strains of *P. vivax* differ in their response to the drug. The Madagascar strain responds readily to 50 to

TABLE 1.—*Clinical Relapses After Inoculation with Plasmodium Vivax (Benign Tertian Malaria) by Mosquito Bite*

Patients		Treatment Given	Period of Observation, Years	Relapses	
Description	Number			Number	Percentage
From North Holland (Report of the Malaria Committee of the Health Council 1936-1937, Versl. en mededeel. betref. d. volksgezondh., July 1938, pp. 435-460)	Many hundreds	5 to 7 Gm. of quinine sulfate in 5 to 7 days	1½	...	50
From North Holland, Wormerveer (Report of the Malaria Committee of the Health Council 1938-1939, Versl. en mededeel. betref. d. volksgezondh., July 1940, pp. 399-417)	500	Quinoplasmoquine for 2 weeks	1½	116	23
With dementia paralytica (Winckel, C. W. F.: Die Praxis der therapeutischen Malaria, Psychiat. en neurol. Bl. 39: 391 [May-June] 1935)	58	5 Gm. of quinine sulfate in 5 days	1½	9	15.5
With dementia paralytica (Winckel, <i>ibid.</i> )	81	Quinoplasmoquine for 2 weeks	1½	9	11.1

In patients infected with the Madagascar strain of *P. vivax* a somewhat different behavior was seen, as is shown in table 3.

With the Madagascar strain of *P. vivax* I have made the following observations:

1. When the patient has double quotidian, one intravenous injection of 0.05 to 0.075 Gm. of neo-

TABLE 2.—*Effect on Fever of Single Injection of Neoarsphenamine*

Dose of Neoarsphenamine, Gm.	Indication	Number of Cases	Result			
			No Effect	Lowered Temperature	Simple Fever	Some Days' Remission
0.15	(a) Febris duplicata	141	25 (18%)	13 (9%)	69 (48%)	34 (24%)
	(b) A few days rest needed in simple fever	38	11 (29%)	7 (18%)	..	20 (53%)
0.3	(a) and (b) combined *	39	3 (8%)	2 (5%)	6 (15%)	28 (72%)
Total.....		218				

\* Neoarsphenamine kills the malaria parasites best when they are about twenty-four hours old. The injections should therefore be given on an afebrile day.

arsphenamine, given after the end of the attack of fever, as a rule suffices to convert the fever into simple tertian fever. The best results are obtained with 0.075 Gm.; if one gives patients with quotidian fever a dose of 0.1 or 0.15 Gm. the majority will enjoy a few days remission. Therefore, when one wants only to change the fever into a simple tertian one, a dose of 0.075 Gm. is nearly always sufficient.

2. When one desires to obtain a few days complete remission in order to restore the patient's forces, a dose of 0.05 Gm. of neoarsphenamine given on an afebrile day is often sufficient in simple tertian fever. The apyrexia lasts longer when the dose is raised to 0.1 or 0.15 Gm., the optimal dose being 0.1 Gm.

3. When a patient with double quotidian requires a few days rest, an injection of 0.1 or 0.15 Gm., given at the end of the attack of fever, is sufficient. In this case the optimal dose is 0.15 Gm.

4. In case one desires to withhold quinine and still definitely to terminate the fever therapy, the usual

75 mg. and the Dutch strains only to 150 mg. or more. When, therefore, one wants to make use of neoarsphenamine for managing the course of fever one must first make sure of the degree of sensitivity of the parasite strain in use. In addition one must keep in mind that the same amount of a given chemotherapeutic agent (and this is equally true with quinine as with neoarsphenamine) in general becomes more effective as the patient has passed through a greater number of chills and thus supports the action of the drug by an increased amount of resistance developed by his organism.

Useful as neoarsphenamine has proved itself for the regulation of the fever in benign tertian malaria, it is quite useless in quartan malaria (infection with *P. malariae*) the parasite of which is in no way affected

TABLE 3.—*Madagascar Strain of Plasmodium Vivax*

Dose of Neoarsphenamine, Gm.	Indication	Number of Cases	Result			
			No Effect	Lowered Temperature	Simple Fever	Some Days' Remission
0.05	(a) Febris duplicata	72	14 (20%)	2 (4%)	34 (46%)	21 (29%)
	(b) A few days rest wanted in simple tertian fever *	5	..	..	..	5
0.075	(a) Febris duplicata	66	3 (4.5%)	1 (1.5%)	37 (56%)	25 (38%)
	(b) A few days rest wanted in simple tertian fever *	2	..	..	..	2
0.1	(a) Febris duplicata	26	..	..	8 (31%)	18 (69%)
	(b) A few days rest wanted in simple tertian fever *	7	..	..	..	7
0.15	(a) Febris duplicata	16	..	..	2 (13%)	14 (87%)
	(b) A few days rest wanted in simple tertian fever *	22	..	..	..	22
Total.....		216				

\* Neoarsphenamine kills the malaria parasites best when they are about twenty-four hours old. The injection should therefore be given on an afebrile day.

by the drug. One can profit, however, by this state of affairs by combining fever therapy with a simultaneous series of injections of neoarsphenamine. This practice materially reduces the period during which the patient has to remain in the hospital.

## SUMMARY

1. Therapeutic benign tertian malaria often produces undesirable effects when double quotidian develops or when the patient's forces of resistance are too much weakened by the chills and his life is endangered.

2. Intravenous injections of neoarsphenamine constitute a simple means for either changing a double fever into a simple one or for allowing the patient a few afebrile days.

3. Various strains of *P. vivax* are not equal in their sensitivity to neoarsphenamine, and one must first determine the dose required for the strain of parasite in use.

4. Neoarsphenamine cannot replace quinine in the treatment of malaria. For definitely cutting short the fever course, after inoculation by the injection of blood, 5 Gm. of quinine sulfate in five days is required and is sufficient; clinical relapses are not encountered.

5. In cases of infection with *P. malariae* (quartan malaria) neoarsphenamine is ineffective for obtaining a few days pause or for changing a double or triple fever into the simple quartan type.

## THE FREI TEST FOR LYMPHOGRANULOMA VENEREUM

EXPERIENCES WITH A NEW ANTIGEN (LYGRANUM)  
PREPARED FROM INFECTED YOLK SAC OF  
DEVELOPING CHICK EMBRYO

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ST. LOUIS

Since the Frei cutaneous test is the principal confirmatory procedure for the diagnosis of lymphogranuloma venereum, much consideration must be given the availability and specificity of the "antigen" used in the test. At present three sources of antigen are recognized: (a) pus aspirated from the inguinal bubo of a patient with early lymphogranuloma venereum, (b) macerated material from diseased glands and (c) emulsions of the brains of mice intracerebrally infected with virus. Frei test antigen prepared from human pus is not readily available, since cases of lymphogranuloma venereum with fluctuant inguinal buboes are infrequent even in large venereal disease clinics. When such cases are encountered the pus is usually present in small quantities, may vary in "antigen" content in different patients and may be contaminated by the coexistence of other venereal diseases. Macerated material from diseased glands is likewise not readily available. The mouse brain antigen first described by Grace and Suskind<sup>1</sup> does not present these difficulties. An appropriate strain of virus may be transmitted indefinitely through mice.<sup>2</sup> Contamination may be eliminated with proper and careful laboratory technic, and antigens pre-

pared from infected mouse brains can be standardized. Despite favorable reports<sup>3</sup> on the use of mouse brain antigen in the Frei cutaneous test, however, some controversy over the specificity of this antigen has developed. Strauss and Howard,<sup>4</sup> Wawersig<sup>5</sup> and Mesrobian and Bruckner<sup>6</sup> favored the use of the human pus antigen since they found that sensitivity to mouse brain frequently produced false positive reactions. Grace<sup>7</sup> insisted on the importance of the measurement of the papule produced by the mouse brain antigen and by the corresponding control as the only reliable means of differentiating between nonspecific reactions due to injection of foreign substance and reaction to the presence of the virus. The necessity for this type of exact measurement led Binkley and Love<sup>8</sup> and their associates to conclude that the test performed with mouse brain antigen is unreliable. European investigators found Frei antigen prepared from monkey brain to be less reliable than human pus antigen.<sup>9</sup>

### DEVELOPMENT OF EGG YOLK SAC ANTIGEN

Several attempts have been made to propagate the virus of lymphogranuloma venereum on the chorio-allantois of developing chicks. Miyagawa and his collaborators<sup>10</sup> transmitted the virus to mice after five passages in eggs and were able to demonstrate "granulocorpuscles" in the brains of infected mice. Burnet<sup>11</sup> also cultivated the virus on the allantoic membrane of hatching chicks, though no details were given as to the number of passages or the extent of infection. D'Aunoy and von Haam<sup>12</sup> were able to infect the allantois of developing chicks and described specific lesions produced on these membranes. Nauck and Malamos<sup>13</sup> were able to infect mice after transmitting the virus through six serial passages on the chorioallantoic membrane. According to these workers "granulocorpuscles" were not discernible in the preparations of membrane. In cases in which success was attained in the afore-

From the Laboratory Section and Venereal Disease Control Service of the St. Louis Health Division.

This study is incidental to the program of control of venereal disease sponsored by the St. Louis Health Division in cooperation with the United States Public Health Service.

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4. Strauss, M. J., and Howard, M. E.: Frei Test for Lymphogranuloma Inguinale: Experiences with Antigens Made from Mouse Brain, *J. A. M. A.* **106**: 517 (Feb. 15) 1936.

5. Wawersig, R.: Ueber die Verwendung von Tierantigen zur Freischen Reaktion beim Lymphogranuloma inguinale, *Dermat. Wehnschr.* **109**: 1348, 1939.

6. Mesrobian, L., and Bruckner, I.: Sur l'utilisation de l'antigène murin pour la réaction de Frei, *Compt. rend. Soc. de Biol.* **124**: 978, 1937.

7. Grace, A. W.: Frei Antigen Prepared from Mouse Brain, *Arch. Dermat. & Syph.* **39**: 347 (Feb.) 1939.

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13. Nauck, E. G., and Malamos, B.: Ueber Erregerbefunde bei Lymphogranuloma inguinale, *Arch. f. Schiffs- u. Tropen-Hyg.* **41**: 537, 1937.



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mentioned reports, a relatively low grade infection resulted. More recently Rake, McKee and Shaffer<sup>14</sup> attempted to adapt the virus to the chorioallantoic membrane with the view of increasing its activity. Lesions on the membranes occurred with extreme irregularity, and in no case was the virus lethal for the embryo. The fifth membrane passage showed virus to be present, while none was detectable in subsequent passages. According to these workers, the virus decreased in its virulence for mice or was present in the membranes in low titer. Further attempts to increase the activity of the virus were made by the inoculation of mouse brain virus into the yolk sac of the developing chick.<sup>15</sup> After the fifth serial passage (with material from yolk sacs as the inoculum) the virus readily produced a fatal infection of the developing embryo. In subsequent studies<sup>16</sup> these investigators found that it was not necessary to resort to serial passage to produce a lethal infection of the embryo. Smears made from infected yolk sacs showed numerous granulocorpuscles resembling those described by Miyagawa<sup>17</sup> and Schoen.<sup>18</sup>

were tested with the various antigens. A series of intradermal injections was made on the arm, the proximal injection being made with human Frei antigen, two middle injections with egg and mouse brain antigens and two distal injections with the corresponding controls, as is shown in the accompanying illustration. When inoculum consisted of 0.1 cc. of each antigen. Whenever possible the reactions were read within forty-eight to ninety-six hours. Two diameters of the central papule or indurated area were measured with a millimeter scale and recorded. The size of the surrounding erythematous area was not recorded.

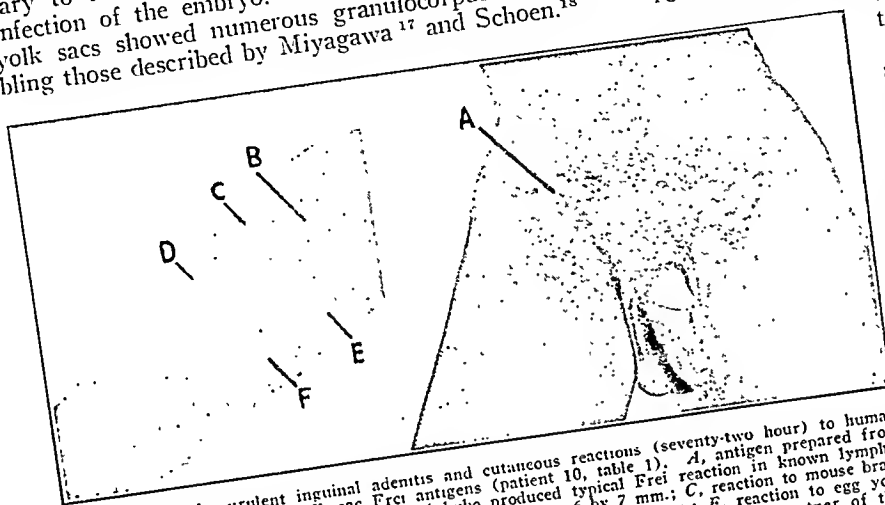
A typical positive reaction consists of an elevated reddened central papule which appears within twenty-four to forty-eight hours and is surrounded by an erythematous areola. In the Negro the erythematous halo is not always easily discernible. The papule reaches its maximum size in about three days, gradually decreasing thereafter. In strong reactions the papule may have a vesicular or pustular center. The positive reaction may be discernible for several days and sometimes heals with distinct pigmentation at the area of injection.

Of the 42 persons tested, 40 gave a positive, 1 a doubtful and 1 a negative reaction to yolk sac antigen; 34 gave a positive, 5 a doubtful and 3 a negative reaction to mouse brain antigen and 38 gave positive, 1 a doubtful and 3 a negative reaction to human pus antigen. Thirty-three persons had positive reactions with all three antigens. All doubtful reactions to mouse brain were positive when the egg and human antigens were used. The criteria recommended by Grace<sup>19</sup> were used in interpreting the results. The diameter of a papule indicating the upper limit of a negative reaction was 6 mm., while a papule 7 mm. in diameter or larger was considered indicative of a positive reaction.

A reaction to normal mouse brain control material (with the average diameter of the papule about 3.6 mm.) occurred in 29 of these persons, while only 16 reacted to the control yolk sac material (with the average diameter about 2.8 mm.), indicating greater incidence in sensitivity to the former. The results are presented in table 1.

A control group of 20 persons with no evidence of present or past infection were also tested. None of these persons gave evidence of infection, since no cutaneous reactions were produced with a potent, freshly prepared Frei antigen made from human material. Only 2 showed slight (2 to 5 mm.) reactions to human Frei antigen. Every person in this series gave a cutaneous reaction to either mouse brain antigen or control material, although all were below the upper limits of a negative Frei reaction (6 mm.). Three subjects reacted to the lygranum control, while 6 showed a reaction to the antigen, all below 4 mm. in diameter. The results are shown in table 2.

TESTS FOR HYPERSENSITIVITY TO EGG ANTIGEN  
It is generally known that any foreign substance when injected intradermally into a human subject will produce an inflammatory response at the site of inoculation. The severity of the reaction will be influenced by any hypersensitivity to the material in the person



Patient with purulent inguinal adenitis and cutaneous reactions (seventy-two hour) to human pus, mouse brain and egg yolk sac Frei antigens (patient 10, table 1). A, antigen prepared from pus aspirated from fluctuant right inguinal bubo produced typical Frei reaction in known lymphogranulomatous patients. B, reaction to human pus antigen, 6 by 7 mm.; C, reaction to mouse brain antigen, 12 by 16 mm.; D, reaction to mouse brain control, 3 by 5 mm.; E, reaction to egg yolk sac antigen, 8 by 10 mm.; F, egg yolk sac control; no reaction. The marital partner of this patient is referred to in table 1 (patient 11).

## MATERIALS AND PROCEDURE

The present study was undertaken to establish the value of infected material from egg yolk sacs (lygranum)<sup>19</sup> as a Frei antigen for use in the diagnosis of lymphogranuloma venereum. The specificity and sensitivity of this material was compared with that of mouse brain<sup>20</sup> and human pus antigens. The latter was prepared from pus aspirated from fluctuant unruptured inguinal buboes, according to Frei's<sup>21</sup> technic. Forty-two patients<sup>22</sup> with active lymphogranulomatous infection or with a history of past infection

14. Rake, Geoffrey; McKee, Clara M., and Shaffer, M. F.: Agent of Lymphogranuloma Venereum in the Yolk-Sac of the Developing Chick Embryo. *Proc. Soc. Exper. Biol. & Med.* 43: 332, 1940.
15. This technic was used successfully by Cox (Public Health Rep. 53: 2241, 1938) for obtaining large numbers of rickettsia.
16. Shaffer, M. F.: Personal communication to the authors.
17. Miyagawa, Y.; Mitamura, T.; Yaol, H.; Ishii, N.; Nakajima, H.; Okanishi, J.; Watanabe, S., and Sato, K.: Studies on the Virus of Lymphogranuloma Inguinale. *Nicholas, Favre and Ducand, Jap. J. Exper. Med.* 13: 1, 1935.
18. Schoen, R.: Nouvelles données expérimentales sur le virus de la lymphogranulomatose inguinale. *Ann. Inst. Pasteur* 62: 260, 1939.
19. "Lygranum" is the name applied by McKee, Rake and Shaffer (Proc. Soc. Exper. Biol. & Med. 44: 410, 1940) to virus propagated in the yolk sac of the developing chick. Dr. Morris F. Shaffer of the Institute for Medical Research, New Brunswick, N. J., provided the necessary supply of egg antigen (lygranum) and corresponding control material.
20. The mouse brain antigen was obtained from the Lederle Laboratories, Pearl River, N. Y., through Dr. W. G. Malcolm.
21. Frei, W.: Eine neue Hautreaktion bei "Lymphogranuloma inguinale." *Klin. Wchnschr.* 4: 2148, 1925.
22. Dr. Lucius S. Davis of the St. Mary's Infirmary referred patients for study.

inoculated. This must be considered when one interprets the cutaneous response to any Frei "antigen." None of the persons tested in the studies of Grace and Suskind<sup>1</sup> showed natural hypersensitivity to the protein of mouse brain. Only 1 of 65 persons showed acquired hypersensitivity to mouse brain protein after having received nine tests during a seven month period. Of the 42 patients with lymphogranuloma venereum dealt with in table 1, none showed natural hypersensitivity to the egg yolk sac material. Moreover, none of 11 persons in the control group of normal persons retested after two weeks and again after three weeks showed either natural or acquired hypersensitivity to the yolk sac material, probably because the Frei antigen and the corresponding control material as prepared by

TABLE 1.—Results of Frei Test with Human Pus, Mouse Brain and Egg Antigens in Group of Clinically Lymphogranulomatous Patients and Persons with Past History of Infection

Patient	Sex	Race	Reaction to Frei Test *					
			Human Pus		Mouse Brain		Lygranum (Egg)	
			Antigen	Interpretation	Control	Antigen	Interpretation	Control
1	+	N	7 x 11	+	3 x 5	13 x 12	+	12 x 13
2	+	N	0 x 13	+	3 x 3	13 x 8	+	8 x 15
3	+	N	0 x 9	+	5 x 6	6 x 8	+	8 x 9
4	+	N	7 x 8	+	3 x 3	8 x 9	+	13 x 15
5	+	N	5 x 8	+	3 x 3	12 x 18	+	9 x 10
6	+	N	6 x 8	+	3 x 3	7 x 8	+	8 x 11
7	+	N	0 x 13	+	3 x 4	10 x 17	+	10 x 10
8	+	N	8 x 8	+	3 x 4	12 x 12	+	5 x 7
9	+	N	2 x 3	+	4 x 5	12 x 6	+	8 x 10
10	+	N	6 x 7	+	3 x 5	12 x 16	+	7 x 9
11	+	N	6 x 9	+	3 x 5	12 x 12	+	7 x 8
12	+	N	7 x 7	+	6 x 6	5 x 7	+	7 x 8
13	+	N	8 x 12	+	9 x 9	9 x 9	+	7 x 8
14	+	N	6 x 7	+	5 x 6	6 x 7	+	7 x 8
15	+	N	7 x 9	+	4 x 6	12 x 16	+	9 x 11
16	+	N	7 x 8	+	4 x 6	9 x 10	+	7 x 7
17	+	N	7 x 7	+	2 x 4	9 x 9	+	7 x 8
18	+	N	6 x 0	+	4 x 4	10 x 12	+	6 x 9
19	+	N	6 x 8	+	7 x 8	7 x 8	+	7 x 7
20	+	N	3 x 3	+	3 x 6	4 x 5	+	4 x 6
21	+	N	9 x 12	+	4 x 3	11 x 14	+	7 x 9
22	+	N	7 x 9	+	3 x 3	10 x 13	+	6 x 11
23	+	N	8 x 11	+	4 x 4	9 x 11	+	7 x 0
24	+	N	5 x 8	+	5 x 6	6 x 8	+	8 x 13
25	+	N	7 x 8	+	7 x 7	7 x 7	+	6 x 9
26	+	N	7 x 7	+	7 x 9	7 x 9	+	7 x 9
27	+	N	9 x 10	+	7 x 9	7 x 9	+	7 x 8
28	+	N	7 x 8	+	2 x 4	10 x 12	+	9 x 10
29	+	N	6 x 9	+	7 x 8	7 x 8	+	7 x 7
30	+	N	7 x 8	+	4 x 5	8 x 10	+	8 x 8
31	+	N	8 x 8	+	9 x 10	9 x 10	+	7 x 9
32	+	N	—	—	2 x 4	3 x 3	+	7 x 7
33	+	N	7 x 9	+	3 x 4	9 x 12	+	8 x 8
34	+	N	9 x 10	+	—	8 x 8	+	8 x 9
35	+	N	5 x 8	+	5 x 5	5 x 8	+	6 x 8
36	+	N	6 x 8	+	4 x 5	12 x 14	+	8 x 10
37	+	N	7 x 7	+	7 x 7	7 x 7	+	7 x 9
38	+	N	8 x 9	+	2 x 3	8 x 10	+	8 x 8
39†	+	N	5 x 5	+	3 x 4	6 x 9	+	7 x 7
40‡	+	N	7 x 9	+	3 x 4	9 x 10	+	6 x 8
41§	+	N	6 x 8	+	3 x 5	10 x 10	+	7 x 8
42¶	+	N	7 x 7	+	2 x 4	11 x 13	+	9 x 12

\* Size of papule recorded in millimeters; upper limit of papule in negative reaction is 6 mm.; papule in positive reaction is 7 mm. or larger.

† Marital partner of patient 38; no clinical evidence of lymphogranuloma venereum. Patient 38 showed active clinical signs of the disease.

‡ Female impersonator; admits sodomy; superficial perianal granulomatous abscesses; negative cutaneous reaction with *Haemophilus* of Ducrey; positive Kahn reaction.

§ Female impersonator; admits sodomy; history of lymphogranuloma venereum; negative cutaneous reaction with *Haemophilus* of Ducrey; positive Kahn reaction.

Rake, McKee and Shaffer<sup>14</sup> is relatively free from the constituents of yolk sac. No attempts were made to ascertain whether sensitization to the virus occurs.

#### COMMENT

Antigen prepared from the yolk sac of the developing chick embryo infected with the virus of lymphogranuloma venereum can replace that prepared from

infected mouse brain or from human pus for performing the Frei cutaneous test. That yolk sac antigen (lygranum) is superior to mouse brain antigen in sensitivity and specificity is evident from an analysis of the results obtained in 42 patients with lymphogranuloma venereum and 20 nonlymphogranulomatous persons. In

TABLE 2.—Results of Frei Test with Human Pus, Mouse Brain and Egg Antigens in Group of Nonlymphogranulomatous Persons

Patient	Sex	Race	Frei Test					
			Human Pus		Mouse Brain		Lygranum (Egg)	
			Antigen	Interpretation	Control	Antigen	Interpretation	Control
1	+	N	—	—	3 x 4	3 x 6	—	—
2	+	N	—	—	4 x 5	12 x 3	—	—
3	+	N	—	—	3 x 4	4 x 5	—	—
4	+	N	—	—	—	2 x 3	—	—
5	+	N	—	—	3 x 3	4 x 5	—	—
6	+	N	2 x 5	—	3 x 4	3 x 5	—	—
7	+	N	—	—	3 x 4	2 x 4	—	—
8	+	N	—	—	3 x 4	2 x 4	—	—
9	+	N	—	—	3 x 4	3 x 4	—	—
10	+	N	—	—	3 x 3	3 x 4	—	—
11	+	N	—	—	12 x 3	3 x 4	—	—
12	+	N	—	—	2 x 3	2 x 3	—	—
13	+	N	—	—	12 x 3	12 x 4	—	—
14	+	N	—	—	3 x 3	4 x 4	—	—
15	+	N	—	—	3 x 4	12 x 4	—	—
16	+	N	—	—	3 x 4	3 x 5	—	—
17	+	N	—	—	3 x 4	3 x 3	—	—
18	+	N	2 x 3	—	3 x 5	3 x 3	—	—
19	+	N	—	—	3 x 3	3 x 4	—	—
20	+	N	—	—	3 x 3	12 x 3	—	—

5, or 11.9 per cent, of the cases of lymphogranuloma venereum, the papules appearing in reaction to control mouse brain material were 5 mm. or more in diameter and were indistinguishable from those seen in positive Frei reactions. In each of these cases a positive diagnosis could be made with the yolk sac antigen or with the material from human pus. Throughout the investigation the reactions to mouse brain were invariably more intense than those resulting from human pus or yolk sac material. The average diameter of the papule in a positive reaction to mouse brain antigen and to control material was 10.7 mm. and 3.6 mm., respectively, while positive reactions to yolk sac antigen and control material were 9.5 mm. and 2.8 mm., respectively. Nonspecific papules were produced in 29 of the 42 lymphogranulomatous persons receiving control mouse brain material, while only 16 patients showed reactions to the lygranum control material.

The experience with the new antigen (lygranum) prepared from the infected yolk sac of the developing chick embryo presented in this report substantiates the recently reported observations of Grace, Rake and Shaffer.<sup>23</sup>

#### CONCLUSIONS

1. Yolk sac antigen (lygranum) is superior to mouse brain antigen for performance of the Frei cutaneous test for lymphogranuloma venereum.

2. Comparatively few nonspecific reactions are produced with the egg control material as compared with the mouse brain control.

3. The most satisfactory confirmatory procedure for the diagnosis of lymphogranuloma venereum is the Frei cutaneous test with yolk sac antigen (lygranum).

3 Municipal Courts Building.

23. Grace, A. W.; Rake, Geoffrey, and Shaffer, M. F.: A New Material (Lygranum) for Performance of the Frei Test for Lymphogranuloma Venereum, *Proc. Soc. Exper. Biol. & Med.* 45: 259, 1940.

## TREATMENT OF MENINGOCOCCIC MENINGITIS AND MENINGOCOCCEMIA WITH SULFADIAZINE

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HALIFAX, NOVA SCOTIA

In August 1940 the city of Halifax, Nova Scotia, experienced the beginning of an epidemic of meningococcal meningitis which gradually increased in intensity during the next six months, reaching an apparent peak of case incidence during January and February 1941. The total number of hospitalized patients during this period was 93, of whom 82 were treated with sulfapyridine. The cases of 20 of these patients have been reported by Black and MacKenzie<sup>1</sup> and by Reid and Turner.<sup>2</sup> Seven

The opportunity to study this disease at the peak of the epidemic arose during a survey of epidemic infectious diseases undertaken by a group from Harvard Medical School, headed by Dr. J. Howard Mueller. The survey was conducted with the consent and cooperation of the health and medical authorities of Halifax. At that time the use of sulfadiazine for various infectious diseases<sup>3</sup> was being studied in the Boston City Hospital. Preliminary observations had indicated that sulfadiazine was considerably less toxic than other sulfonamide drugs and that it was effective in endemic meningococcal infections. Permission to extend these observations to epidemic meningitis was granted by the Office of Public Health and Welfare of Halifax.<sup>4</sup>

In this paper are included 11 consecutive patients admitted to the Infectious Disease Hospital of Halifax from the latter part of January through February. These patients were treated with sulfadiazine, and all recovered. Also included here are 3 patients with sporadic meningococcal infection treated with sulfadiazine at the Boston City Hospital. Two of these patients had meningitis and 1 had meningococcemia and arthritis without evidence of meningeal involvement. One of the patients with endemic meningitis died.

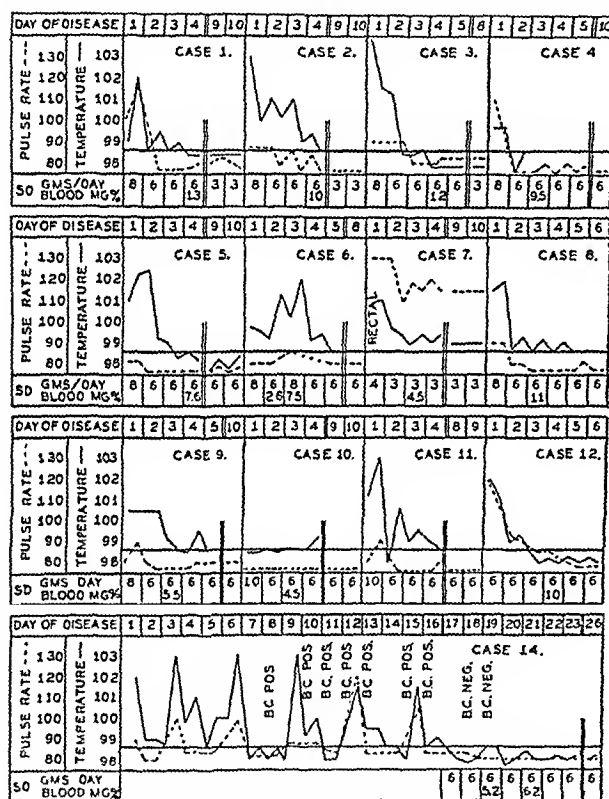
## CLINICAL ASPECTS

The relevant data concerning the individual patients are recorded in the accompanying table. One of the patients (case 7) was 2 years old; the others were adolescents and adults ranging in age from 14 to 60. The duration of illness before treatment varied from five hours to six days, with the exception of that of the patient with meningococcemia (case 14) in which twenty-three days elapsed before chemotherapy. The majority of the patients presented the typical picture of meningitis on admission. The onset was sudden with malaise, followed rapidly by headache, stiff neck, nausea and vomiting. The individual patients showed considerable variation in the severity of illness. All except 1 (case 10) had an elevated temperature either at the time of admission or within a few hours thereafter.

## BACTERIOLOGIC STUDIES

Initial lumbar puncture in the 13 cases of meningitis revealed turbid fluid under increased pressure. The diagnosis was confirmed bacteriologically<sup>5</sup> in all cases but 1 (case 5), in which fluid was obtained five hours after onset. Stained smears of the cerebrospinal fluids revealed gram-negative intracellular diplococci in 9. Meningococci were grown from the fluids in 9 of the 12 cases in which cultures were taken. Blood cultures were made in 12 cases, but meningococci were found in only 1.

Nasopharyngeal cultures were taken in 8 cases, of which 5 were positive for meningococci. Repeated swabs in 3 of these cases were negative by the second or third day of treatment and remained negative. In 1 instance, culture was negative on admission, positive on the second day of chemotherapy and negative there-



Clinical course in 13 cases of meningococcal infection. SD = sulfadiazine; B.C. = blood culture. Cases 1 to 12, meningococcal meningitis; case 14, meningococcal meningitis with arthritis.

deaths occurred in the entire sulfapyridine-treated group: 1 of the deaths was of a patient with diabetic acidosis, 3 occurred shortly after admission, and 1 was attributed to obstructive hydrocephalus which appeared as a late complication. In the other 2 cases the disease progressed without complications but terminated fatally in spite of sulfapyridine and specific serotherapy.

Dr. Thomas is Fellow of the Frederick Tilney Memorial Fund. This study was aided in part by a grant from the William W. Wellington Fund of Harvard Medical School.

From the Thorndike Memorial Laboratory, Second and Fourth Medical Services (Harvard), Boston City Hospital, and the Departments of Medicine and of Bacteriology and Immunology, Harvard Medical School, and from the Office of Public Health and Welfare, Halifax, N. S.

1. Black, G. A., and MacKenzie, K. A.: Report of Seventeen Cases of Cerebrospinal Meningitis, with Special Reference to Treatment, *Nova Scotia M. Bull.* 20: 19, 1941.

2. Reid, J. W., and Turner, G. W.: Sulfapyridine in Cerebrospinal Meningitis, *Nova Scotia M. Bull.* 20: 26, 1941.

3. Finland, Maxwell; Strauss, Elias, and Peterson, Osler: Sulfadiazine: Evaluation of Its Therapeutic and Toxic Effects in Four Hundred and Forty-Six Patients, *J. A. M. A.*, this issue, p. 2641.

4. Dr. D. J. MacKenzie, director of the Provincial Public Health Laboratory, Mr. Henry Ross and the staff of the Infectious Disease Hospital also gave their assistance. The sulfadiazine and the serums for meningococcal typing used in this study were supplied by Lederle Laboratories, Inc.

5. The isolation of these strains was accomplished by Dr. J. Howard Mueller and his associates on a casein hydrolysate-starch agar medium (Mueller, J. H., and Hinton, J.: Personal communication to the authors).

after. Para-amino-benzoic acid was employed as an inhibitive agent in all cultures taken after chemotherapy was instituted.<sup>6</sup>

The epidemic strains of meningococcus were determined to be type I, both by agglutination and by the quellung reaction.<sup>7</sup> The strains in the 3 Boston cases did not give a quellung reaction, but Dr. Sara E. Branham of the National Institute of Health identified two of them as type II by agglutination. The biologic properties of these strains will be reported elsewhere.

METHOD OF TREATMENT

The same general plan of treatment was followed in all cases. Four Gm. of sulfadiazine was administered

Blood levels<sup>8</sup> of free and total sulfadiazine were determined between the third and the sixth day. The values obtained are charted. Chemotherapy was continued for a period of six to eleven days.

Supportive therapy was employed as indicated. No antimeningococcic serum or specific agents other than sulfadiazine were employed. Fluids were administered orally or parenterally in amounts sufficient to permit excretion of approximately 1,500 cc. of urine daily.

Diagnostic lumbar puncture was performed on admission, but the procedure was repeated only for definite indications such as signs of increased intracranial pressure or failure of response to therapy.

Summary of Fourteen Cases of Meningococcic Infection with Sulfadiazine Therapy\*

Case Number	Sex	Age	Clinical Features on Admission										Initial Cerebrospinal Fluid		Sulfadiazine Therapy										Course; Day of Treatment		
			Duration, Days	Headache	Stiff Neck	Vomiting	Drowsiness	Delirium	Coma	Petechiae	Herpes	Severely †	Turbidity	Smear	Culture	Blood Culture	Nasopharyngeal Culture	Type of Meningococcus	Route of Administration	Total Dose, Gm.	Duration, Days	Toxic Effects	Temperature Lower, Clinically Improved	Afebrile	Complete Symptomatic Recovery		
1	♀	19	1	+	+	+	+	0	0	0	0	+	++	+	+	0	+	I	Oral	56	10	None	2	4	5		
2	♀	43	5	+	+	+	0	0	0	0	+	+	++	+	+	0	+	I	Oral	56	10	None	2	4	5		
3	♀	21	2	+	+	0	+	0	0	0	+	++	++	+	0	0	—	Oral	53	8	Ureteral pain; microscopie hematuria, crystals in urine 8th day	3	3	4-5			
4	♂	23	2	+	+	+	0	0	0	0	0	+	++	+	0	0	+	I	Oral	62	10	None	2	2	4-5		
5	♂	37	5 hrs.	+	+	+	+	+	0	+	+	+++	++	0	0	0	—	Intravenous, oral	62	10	None	3	3	4-5			
6	♂	24	2	+	+	+	+	0	0	+	+	++	++	+	+	0	+	I	Oral, intravenous	58	10	None	4	5	6		
7	♂	2	2	..	+	+	+	+	0	+	0	+++	++	+	+	0	0	I	Oral	31	10	None	3	3	4		
8	♂	60	0	+	+	+	0	0	0	0	0	+	++	+	+	0	+	I	Oral	56	10	None	2	5	5		
9	♂	14	12 hrs.	+	+	+	+	+	+	+	+	+++	++	0	+	+	—	I	Intravenous, intramuscular, oral	62	10	None	3	5	5		
10	♂	21	2	+	+	+	0	0	0	0	0	+	++	+	+	0	—	I	Intravenous, oral	58	10	None	2	..	5		
11	♂	22	1	+	+	+	0	0	0	0	+	+	++	+	—	—	—	—	Intravenous, oral	70	13	None	2	4	5		
12†	♀	24	4	+	+	+	0	0	0	0	0	+	++	0	+	0	—	..	Oral	36	6	Flank pain; microscopie hematuria 8th day; no crystals in urine	3	3	5		
13	♂	47	?	Admitted in deep coma.....										+	0	+	—	—	II	Oral (stomach tube)	7	1	.....	Died in 10 hours			
14	♂	24	6	Fever, arthritis and malaise; palpable spleen; no petechiae; no meningitis										0	0	0	+	—	II	Oral	54	10	None	1	1	5-6	

\* + = positive or present; 0 = negative or absent; — = not done.  
† Severity of illness: +++ = severely ill, coma or extreme prostration; ++ = acutely ill, delirium or drowsiness, moderate prostration; + = acutely ill, rational.  
‡ Primipara; pregnant 8 months; pregnancy unaffected.

orally in the first four hours, followed by 1 Gm. every four hours. Patients unable to take oral medication were given the same doses of sodium sulfadiazine in physiologic solution of sodium chloride intravenously. In cases 10 and 11, oral therapy was supplemented by simultaneous administration of 2 Gm. of sodium sulfadiazine, either intravenously or intramuscularly.

6. Strauss, Elias; Lowell, F. C., and Finland, Maxwell: Observations on the Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid, *J. Clin. Investigation* 20:189 (March) 1941. Janeway, C. A.: Method for Obtaining Rapid Bacterial Growth in Cultures from Patients Under Treatment with Sulfonamides, *J. A. M. A.* 116:941 (March 8) 1941.  
7. Clapp, F. L.; Phillips, S. W., and Stahl, H. J.: Quantitative Use of Neufeld Reaction with Special Reference to Titration of Type II Antipneumococcic Horse Sera, *Proc. Soc. Exper. Biol. & Med.* 33:302 (Nov.) 1935.

RESULTS

The general course of each patient may be seen in the last three columns of the table and in the temperature records reproduced here. In 11 of the patients with meningitis considerable clinical improvement was apparent on the second or third day of chemotherapy, as indicated by relief of malaise and headache and return of appetite. Temperature responses of most patients were prompt and occurred simultaneously with the sub-

8. These determinations were performed by Miss Helen Robertson in the Chemical Laboratory of the Department of Pathology, Dalhousie University Faculty of Medicine, through the kindness of Dr. R. P. Smith. The method of Bratton and Marshall (A New Coupling Component for Sulfanilamide Determination, *J. Biol. Chem.* 128:537 [May] 1939) was used.

jective improvement. One patient with meningitis (case 6) showed no apparent response to chemotherapy during the first three days. On the third day the free sulfadiazine level was only 2.6 mg. per hundred cubic centimeters of blood. He was given 2 Gm. of sodium sulfadiazine intravenously in addition to the usual oral dose; on the following day the blood level was 7.5 mg. (free) and symptomatic improvement had begun. Another patient (case 12), a primipara in the eighth month of pregnancy, made an uneventful recovery and was delivered at term of a normal infant. The 12 patients with meningitis who recovered became free of symptoms after an average period of five days. There were no recurrences, and recovery was complete without residuals. One patient in the Boston group (case 13) died ten hours after admission and received only 7 Gm. of sulfadiazine. The blood sulfadiazine level shortly before death was low (2.8 mg., free and total), and the cerebrospinal fluid showed only a slight trace of the drug. Attempts to culture meningococci from material obtained at autopsy, however, were unsuccessful.

The patient with meningococcemia was a man aged 24, an Italian, who had been ill with fever and joint pains for six days before entry. There was no history of gonorrhea and he stated that he had not been exposed to it. The right elbow and right ankle were tender but not hot or swollen. Repeated blood cultures were positive for gram-negative diplococci which were identified as meningococci. Repeated complement fixation tests and prostatic smears and cultures were negative for gonococci. There was no evidence of endocarditis. Recovery was prompt on administration of sulfadiazine; the temperature remained normal, and all blood cultures made following chemotherapy were sterile.

Complications which probably were attributable to sulfadiazine were encountered in 2 cases. In 1 of these (case 3) pain of right ureteral distribution developed on the eighth day of chemotherapy. The pain lasted several hours. Urine voided at this time showed from 10 to 15 red blood cells per high power field and numerous sulfadiazine crystals in uncentrifuged specimens. In the other (case 12) pain in the right flank associated with microscopic hematuria developed on the eighth day, but no sulfadiazine crystals were found. The urine in both cases cleared rapidly after cessation of chemotherapy. Nausea, vomiting, dermatitis, cyanosis or mental symptoms attributable to the drug were not present.

An adequate statistical comparison of the therapeutic efficacy of sulfapyridine and sulfadiazine cannot be made from these data. Clinical impressions indicated that the two drugs were about equally effective against the meningococcus. Sulfadiazine had the advantage of being considerably less toxic.

#### SUMMARY

Sulfadiazine has been employed as the sole specific agent in the treatment of 13 patients with meningococcal meningitis and 1 with meningococcemia with arthritis but without meningitis. One patient with meningitis died ten hours after admission. The remaining 13 patients recovered promptly and completely.

**Glycogen Storage.**—About 500 Gm. of glycogen are, on an average, stored in the body, about 100 Gm. in the liver, and practically all the rest in the skeletal muscles.—Wright, Samson: Applied Physiology, New York, Oxford University Press, 1940.

## Clinical Notes, Suggestions and New Instruments

### PERFORATION OF UTERUS BY HYDATIDIFORM MOLE

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Since perforation of the uterus by a hydatidiform mole is an extremely rare condition, it is felt that the presentation of the following account is justified.

In both Lord's<sup>1</sup> case in 1868 and Seitz's<sup>2</sup> in 1904 the outcome was fatal. Then followed a series of cases in which treatment by supracervical hysterectomy was successful. One was reported each by Waldo<sup>3</sup> in 1910, Harkness<sup>4</sup> in 1921, Krellenstein<sup>5</sup> in 1924, Mazet<sup>6</sup> in 1926 and Kallnikoff<sup>7</sup> in 1928. Kallnikoff's patient was a multipara under the age of 25, as was Johansson's<sup>8</sup> patient in 1929, who died after hysterectomy. Bland's<sup>9</sup> patient in 1927, a nullipara aged 30, died fourteen months after the original operation following exploration of a recurrent chorioepithelioma. The first operation was performed at a time when the hydatid mole was undergoing malignant change. Gizowski<sup>10</sup> reported another patient with such a uterine perforation in 1934, and McClure<sup>11</sup> in 1935 added an account of a woman aged 24 who was operated on with a diagnosis of ectopic pregnancy and who recovered after a blood transfusion and pan-hysterectomy. So far as I can tell the twelfth case to be reported was that of Conway<sup>12</sup> in 1938, in which the patient was a septipara aged 51 who died with *Clostridium welchii* peritonitis. If the figures are correct, our case is the thirteenth.

It was my privilege recently to consult with and to assist Dr. K. C. Chock in the following case, which had all the earmarks of a ruptured tubal gestation with peritoneal inundation. The case is presented with Dr. Chock's permission.

#### REPORT OF CASE

L. M., a Hawaiian woman aged 44, was admitted to the surgical service of the Queen's Hospital on Aug. 18, 1940 with complaints of severe, diffuse pain in the lower part of the abdomen and vaginal bleeding. She flatly denied having made any attempts to induce abortion. A persistent, painless dripping of bloody fluid from the vagina had begun on June 11 and had persisted intermittently to the time of admission to the hospital. At noon, on the date of admission, the patient was seized with agonizing pain in the left lower quadrant of the abdomen. She was seen shortly after the onset and was pale and in obvious shock. At this time an indefinite mass could be felt in the lower part of the abdomen mostly to the left of the midline. Tenderness gradually shifted to the right lower quadrant of the abdomen as well, and on admission, five hours after onset of the pain, the tenderness was diffuse and agonizing.

The past history was chiefly one of a succession of pregnancies and was otherwise essentially negative. This was the patient's sixteenth pregnancy. There were eight living children and there had been two stillborn. The other pregnancies had terminated in early spontaneous abortion. The menses had been regular and painless from the time of her last delivery three years and seven months prior to the present admission to the hospital except for amenorrhea of eleven months' duration. At her last labor she had been delivered of stillborn 8 months macerated twins weighing 5 pounds 4 ounces (2,381 Gm.) and

From The Clinic.

1. Cited by Krellenstein.<sup>5</sup>
2. Waldo, R.: Results at Lebanon Hospital of Deferred Operations for Extrauterine Pregnancy, *Am. J. Obst.* 62: 863, 1910.
3. Krellenstein, J. B.: Hydatid Mole with Spontaneous Rupture of Uterus, *Am. J. Obst. & Gynec.* 8: 636, 1924.
4. Mazet: Perforation utérine par môle hydatidiforme, *Lyon méd.* 137: 336, 1926.
5. Kallnikoff, J. I.: Ein Fall von Mola hydatidosa. Perforation Uteri, *Amputatio Uteri supravaginalis*, *Monatschr. f. Geburtsh. u. Gynäk.* 79: 181, 1928.
6. Johansson, J.: Mola hydatidosa destruens, *Acta obst. et gynec. Scandinau.* 8: 131, 1929.
7. Bland, P. B.: Hydatidiform Mole Complicated by Perforation of Uterine Wall and Secondary Chorio-Epithelioma of the Pelvis, *Am. J. Obst. & Gynec.* 13: 189, 1927.
8. Gizowski, T.: Spontaneous Perforation of Uterus by Malignant Hydatidiform Mole, *Ginek. polska* 13: 180, 1934.
9. McClure, H. I.: Hydatidiform Mole: Spontaneous Perforation of Uterus, *J. Obst. & Gynec. Brit. Emp.* 42: 663, 1935.
10. Conway, F. M.: Spontaneous Rupture of the Uterus Due to Hydatidiform Mole, *Ann. Surg.* 107: 627, 1938.



4 pounds 10 ounces (2,098 Gm.) respectively. The cause of the fetal deaths was obscure. The Wassermann and Kahn reactions of the blood were negative.

Physical examination revealed that the patient was obese and was in shock, with a pale gray face, a feeble, rapid pulse and clamminess of the extremities. Her underwear was soaked with bright red blood, and she complained of agonizing generalized abdominal pain. The temperature was 97 F., the pulse rate 120, the respiratory rate 24 and the blood pressure 68 systolic and 50 diastolic (?). There was exquisite tenderness of the entire abdomen and dullness of the flanks on both sides, although the patient's condition was too poor to warrant testing for shifting dullness. A wave of fluid was elicited, and a large tender mass the size of a grapefruit was felt in the midabdomen, rising up and out of the pelvis. On pelvic examination the cervix was noted to be soft, and there was exquisite tenderness of the cul-de-sac with the feel of a downward bulge caused by collected fluid. The diagnosis on admission was ruptured ectopic pregnancy or ruptured ovarian cyst.

**Laboratory Data.**—On admission the red blood cell count was 3,000,000 and the white blood cell count 32,000, with 90 per cent neutrophils and 10 per cent lymphocytes. A donor whose blood was compatible was found, and a transfusion of 550 cc. of citrated blood was given by the indirect method before operation and again immediately after operation.

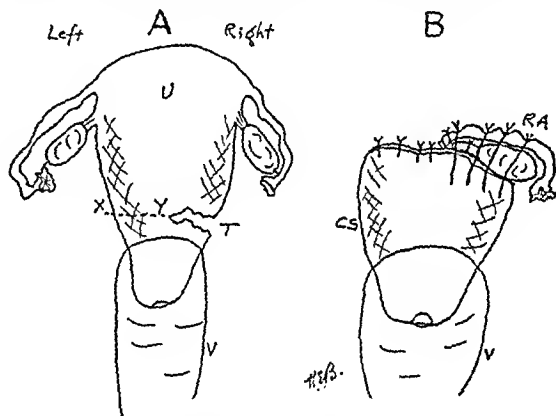
**Operation.**—As soon as the patient's condition improved after the initial transfusion, the abdomen was opened through an incision along the midline. Anesthesia with nitrous oxide and ether was given. Approximately 1,000 cc. of blood and blood clots was found and most of it removed by aspiration and by mopping with gauze tapes. During the process a firm mass of tissue the size of a lemon and yellowish red was lifted out of the cul-de-sac. This was quickly incised with a scalpel and was seen to contain many cystic tumors of varying size suggesting a typical hydatid mole. The uterus was inspected next. Its size was approximately that of a three months pregnant uterus. To our dismay a ragged, 4 cm. rent was found on the posterolateral surface of the uterus, as shown in figure 1 A. This rent was plugged with firm blood clots when seen. It admitted three fingers easily. The uterus was removed, the incision being carried around from the end of the tear. The adnexa on each side were normal in appearance except for congestion. The left fallopian tube and ovary were removed with the uterine body but the right adnexa were retained and were used as a tampon to plug the rent. The tissues here were friable, and sutures cut through until we drew the right adnexa pedicle down as a stopgap (fig. 1 B).

The incision was closed in layers without drainage, and the second transfusion of 550 cc. of citrated blood (making a total of 1,100 cc.) was given. The patient's condition was much improved at the close of the operation.

**Pathologic Report.**—Gross: The specimen consisted of a uterus and a mass of yellowish red tissue measuring 13 by 8 by 6 cm. The surface was irregular, roughened and friable, with adherent blood clots. Sections showed reddish gray friable tissue with areas of hyaline substance almost cartilaginous in consistency. There were a number of spaces lined by a grayish membrane approximately 1 mm. thick, containing clear fluid. The largest cavity measured 1.5 cm. in diameter. An area of brownish red friable tissue was noted at one side extending into the substance of the mass, resembling blood clots. The uterus measured 12 by 11 by 6 cm. The serosal surface was smooth and yellowish pink, with several areas of recent hemorrhage. The right fallopian tube and ovary were attached. The entire cervix was not included. The area of attachment measured 8 by 7 cm. and was rough and severely hemorrhagic. Sections showed yellowish pink myometrium with prominent vessels. The wall measured 3 cm. and had loosely adherent bits of dark reddish gray, friable tissue on the posterior surface. The tissue near the site of removal was dark red and hemorrhagic, with adherent portions of blood clots. The ovary measured 3 by 1.5 by 0.8 cm. The surface was slightly roughened and hemorrhagic. Sections showed grayish stroma with an occasional small cyst. The fallopian tube measured 7.5 by 0.5 cm. The fimbriae were free and the surface of the ostium was smooth. Sections showed no gross abnormalities. A nodule

2 by 1 by 1 cm. was noted at the base of the mesovarium medially which on section showed connection with ovarian substance. The mass consisted of a solid area of yellowish, slightly translucent tissue. There were nine sections.

**Microscopic:** Sections of the fallopian tube showed thickened, edematous plicas and a wall infiltrated by scattered acute inflammatory cells. The epithelium appeared intact. The lumen contained irregular groups of mononuclear and polymorphonuclear cells and areas of serum. Sections of the ovary showed a large mass of moderately degenerated corpus luteum cells with a central area of pigment and relatively loose fibroblastic tissue. The corpus luteum resembled that seen in pregnancy. Sections of myometrium showed large muscle cells, many congested vascular spaces and scattered groups of mononuclear cells. The vascular spaces just beneath the endometrium were large. The endometrial layer was moderately thick and irregular, with decidual reaction and scattered groups of chronic inflammatory cells. This area was vascular also. Glands present were in the late luteum phase. No placental tissue was identified in relation to the endometrial layer. Other sections of myometrium and endometrium showed a similar picture. There was no evidence of a neoplasm. No cervical tissue was identified. A few areas of myometrium showed apparent necrosis of tissue with groups of acute inflammatory cells and blood cells. The vessels appeared normal. Other sections showed groups of large, irregular structures with delicate central network containing spindle cells of the adult Langhans type and a surrounding darkly staining



A, uterus, showing line followed by rent. B, sutured stump showing how right adnexa were used. U = uterus; T = tear; XY = line along which remainder of stump was amputated; V = vagina; CS = cervical stump; RA = right adnexa.

syncytial layer resembling placental villi. Many of the structures were larger than normal placental villi. None appeared definitely cystic. The syncytial cells were occasionally seen in small groups along the edge of the villous structures without evidence of invasion or malignant action. Certain areas of this tissue were hyaline with complete loss of cellular detail. Other areas showed myxomatous trabeculated tissue approaching a cystic character.

**Diagnosis.**—The patient's condition was diagnosed as (1) a hydatid tumor, with (2) decidual reaction, (3) corpus luteum of pregnancy (?), (4) chronic endometritis, (5) chronic metritis and (6) acute salpingitis.

**Subsequent Course.**—A third transfusion of blood (500 cc.) was given on the day after operation, without untoward results. The patient left the hospital in good general condition twenty-eight days after operation. There was some infection of the wound, and healing occurred by granulation. On discharge, however, the incision was firm. The red blood cell count at this time was 4,670,000, with 80 per cent hemoglobin.

To date the condition of the patient has been satisfactory, and she now attends to her daily duties as a housewife and mother. Friedman tests have continued to give negative results.

#### SUMMARY

1. Spontaneous perforation of the uterus by a hydatid mole has been reported twelve times in the literature available to us. The case reported here is the thirteenth.

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## Special Articles

### LEGAL RESPONSIBILITY FOR MEDICAL MALPRACTICE

#### IV. MALPRACTICE CLAIMS IN THE UNITED STATES AND A PROPOSED FORMULA FOR TESTING THEIR LEGAL SUFFICIENCY

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BOSTON

*This is the fourth of a series of six articles on "Legal Responsibility for Medical Malpractice." The three previous articles were published in The Journal March 8, May 10 and May 31, respectively.*

This study has ranged widely; I shall now narrow its orbit and focus sharply on the American scene. The first case of malpractice to be carried to an American court of appeal, so far as I can discover, was that of *Cross v. Guthery*, decided by the Supreme Court of Errors of Connecticut in 1794 (2 Root 90, 1 Am. Dec. 61).

The plaintiff brought an "action on the case" against the defendant, a "practicing physician who professed to be skilled in surgery." The plaintiff alleged that his wife had a "scrofulous humor" in one of her breasts which required its removal and that he employed the defendant, who performed the operation "in so unskillful and cruel a manner, that the plaintiff's wife survived by but three hours." The plaintiff prayed for damages in the sum of £1,000 to cover his costs and expense and to repay him for the deprivation of the service and company of his wife.

The defendant pleaded a compromise, alleging that the plaintiff had previously relinquished any claim for malpractice in exchange for cancellation of a £15 book account incurred in the wife's treatment. The plaintiff traversed this plea by denial of such a compromise. On offer of proof, the jury found that no such compromise had been agreed on and returned a verdict in the plaintiff's favor for £40 damages and costs. One reads:

Defendant moved in arrest of judgment on the ground that the offense charged appeared to be a felony, and by the laws of England, the private injury was merged in the public offense.

The Supreme Court said:

The declaration is sufficient. The rule urged by the defendant is applicable, in England, only to capital crimes, where, from necessity, the offender must go unpunished, or the injured individual go unredressed.

The peculiar ground on which the decision is based is explained by the fact that the defendant had placed his sole reliance on the alleged compromise. When the jury found against him on this question of fact, he seized on the foregoing ingenious but far fetched contention as the only prospect for reversal. It should not be thought that the court supposed the plaintiff's right rested on the necessary proof of a crime. It was simply using a ready answer to dispose of the narrow contention presented by the appeal. The "record" did not require any discourse on legal responsibility for medical malpractice. That the court did not intend to imply that civil responsibility exists only when the mala praxis amounts to a misdemeanor or a crime is shown by its later opinion, in 1812, in the case of *Grannis v. Branden* (5 Day 260, 5 Am. Dec. 143). In this case the Connecticut Supreme Court of Errors upheld a

judgment against a physician based on alleged negligent conduct of a child birth. It rested its decision exclusively on the civil law of negligence, being of opinion that the facts showed both negligent omission (nonfeasance) and negligent commission (misfeasance). The first consisted of the physician's failure to give proper care to the expectant mother for two days preceding the birth; the latter consisted of affirmative unskillful acts in procuring delivery, with resultant wounding of both mother and child.

Much is heard and said about the peril of malpractice claims, but there is a definite lack of accurate information by which one might appraise the reality and the size of this hazard. It would be instructive to know in what states the problem is most acute. In an effort to replace surmise by a more factual appraisal, I have undertaken to collect all the civil malpractice appeal cases decided by American courts from 1794 to Jan. 1, 1940.<sup>1</sup> These have been arranged in tabular form to facilitate comparison. The information raises some challenging inquiries and affords more points of discussion than can be pursued in this paper. I found, among other things, that:

1. A total of 1,513 appeal cases came before American courts between 1794 (first case, *Cross v. Guthery*) and Jan. 1, 1940. These, as preserved precedents, constitute the American common law controlling civil responsibility for medical malpractice.

2. Up to 1860, when the outbreak of the Civil War occurred, there had been only 23 appeal cases; by 1900 the total had risen to 217 and by 1940 to 1,513.

3. There has been a vast increase in these cases since 1900, and, as the chart shows, the percentage increase of this malpractice litigation for ten year periods up to 1940 far outstripped the percentage increase in the number of physicians or in the population. Other factors must account for the remarkable rise.

4. Of the 1,513 cases, decisions in only 15 were handed down by the federal courts. This is explained by the fact that only infrequently is there a basis for federal jurisdiction. Since malpractice jurisprudence rests on common law and involves no federal question, the sole basis on which a federal court might assume jurisdiction is diversity of citizenship. When the plaintiff and the defendant are citizens of different states and the amount in controversy is \$3,000 or more, exclusive of costs and interest, the plaintiff may sue in the federal court, or defendant by proper removal proceedings, timely filed, may remove the case from the state to the federal court at his election (United States judicial code, title 28, section 41). Thus, the only occasions when malpractice cases are apt to be encountered in the federal courts are when a patient from one state has placed himself under the treatment of a physician who is a citizen of a sister state.

5. There is a distinct correlation of the increase in cases of malpractice with the increase in urbanization. The incidence of malpractice cases seems to be higher in metropolitan centers than in small towns.

6. Cases of fracture constitute the most important single type of case. Claims arising out of the nonuse or the negligent use of roentgen rays form another

1. Because of the vast growth of American common law precedents, with more than 1,000,000 appeal cases since 1900, even careful research is not a guarantee that one has located all the authorities. I believe, however, that the table is correct, within a small range of error, and I am sure that any mistake is in the direction of understatement. Only civil actions against physicians and surgeons for alleged malpractice are included; similar actions against hospitals or nurses are excluded, as are prosecutions for alleged criminal malpractice and proceedings under medical practice acts.

large group of cases. Obstetric cases form an important group, and surgical cases constitute a fourth group of considerable size.

7. The majority of cases are based on alleged dereliction of the physician himself rather than on the negligence of his agent or employee.

8. Only occasional cases are against "quacks" or rest on ignorance or alleged lack of qualification. The great majority are against qualified physicians for failure to use average "due care" or "skill" in the particular transaction.

Increasingly, failure to possess or to exercise due skill, rather than lack of care, is becoming the basis of complaint.

In the tables the figures showing the total number of cases per state should be of particular interest to lawyers or to those interested in seeing what states are contributing the most law to the jurisprudence of malpractice. Individual physicians will be more keenly interested in examining the columns which show the incidence of malpractice appeal cases per million of population and per physician. The tables were designed to permit study of judicial evolution and to make possible certain statistical interpretations. In making calculations of rates, population figures were taken from the records of the United States Bureau of the Census; the figures for the number of physicians per state are census figures of the American Medical Association, and the incidence of malpractice cases per state was determined by my own legal researches.

To just what extent does the number of appeal cases represent a reliable index of the magnitude of the malpractice problem and the size of the risk to the average physician in a particular state? A moment's reflection will show that only cases which involve a substantial "stake" are apt to go to the appeal courts: it is not economically worth while to appeal a controversy in which the attorney's fee and the costs will exceed the amount in dispute. Appeal cases, both theoretically and actually, represent judgments ranging from \$1,000 to \$50,000 and are the malpractice claims apt to prove damaging or financially ruinous to the physician. They usually represent cases in which the patient has suffered a grave or disabling injury.

Lawyers know that cases in this group are, for the most part, fought to the courts of last resort, since the large damages sought militate against a compromise if there is even a faint hope of reversal. Defendants also recognize that a period ranging from several months to two years may expire before the highest courts of a particular state dispose of the appeal. During this time a plaintiff can get very hungry and may prove open to a compromise calling for much less money than the judgment. Thus, not only sharp differences on points of law but cogent practical reasons have a bearing on the number of trial court judgments carried to a higher court by appeal.

What were the chances in the ten year period from 1930 to 1940 that an average physician in a given state actually ran of finding himself in an appeal court as a party litigant to a malpractice controversy of substantial magnitude?<sup>2</sup> In North Dakota, the state with the highest incidence of cases per physician, the rate was 0.015, and hence the chances were 15 in 1,000 for the ten year period and 1.5 in 1,000 for each year. In North Carolina, the chances for the whole ten year period were 7 in 1,000; in Colorado, 4.1 in 1,000; in

Texas, 2.6 in 1,000; in Massachusetts, 2.4 in 1,000; in New Jersey, 2.1 in 1,000; in New York, 1.3 in 1,000; in Pennsylvania, 1 in 1,000, and in Nevada and New Mexico the risk was 0. To find the "chance" per year, each of these figures must be divided by 10. Calculations for each state can be made from the tables. It appears that for the physician not engaged in work with fractures, in the practice of surgery or obstetrics or in the use of the roentgen ray for diagnosis or for therapy the actual risk was much below this crude rate. Such a physician, handling a select practice, with few itinerant, transient or recognizable "trouble-making" patients, and armed with a reasonable knowledge of his legal position and accustomed to keeping good records and observing certain medicolegal precautions, may justly expect a lower insurance rate conformable to his status as a preferred risk and also may be influenced by these considerations in arriving at the amount of malpractice insurance he will carry.

It is evident that cases decided by appellate courts represent only a fraction of the complaints of negligent practice; they form the apex of a pyramid of which the parts may be represented thus:

- (1)—[Apex of the pyramid]: Cases actually carried to an appeal court (Table 1 has figures for each state)
- (2)—[Multiply (1) by 3]: Cases disposed of on judgment of the trial court, by payment or by compromise, without appeal
- (3)—[Multiply (1) by 9]: Claims compromised or abandoned after a suit was filed but before trial
- (4)—[Multiply (1) by 20]: Claims compromised by payment of money before any suit was filed
- (5)—[Multiply (1) by 100]: Claims in which action against the physician was considered, but the patient was dissuaded, without payment of money or cancellation of bill, or he abandoned the claim voluntarily
- (6)—[Multiply (1) by 1,000]: Instances in which the physician had been negligent in fact or in the patient's opinion, but no consequence ensued except, perhaps, a loss of good will or a change of patronage.

I hold this schematization out not as an accurate statement of the exact ratios but as an approximation of what seemingly is the order of distribution. I have not been able to get figures from malpractice insurance carriers to establish the ratios. Yet from indirect methods of estimation it appears that the foregoing schematization, based on an accurately known "apex" of appeal cases, represents the approximate truth and will at least serve to give a tentative conception, pending such time as I am able to work out still more accurate multiples. Unfortunately, trial court records are not classified according to the type of case, and accurate information about the broader substratums represented by (2), (3), (4), (5) and (6) cannot be procured by the usual processes of fact gathering.

These multiples may be applied to a concrete example. In Massachusetts from 1930 to 1940, the known number of cases reaching the appellate courts was 18; according to the "pyramid" the number of claims settled after judgment but before appeal ( $3 \times 18$ ) would be approximately 54; the number of claims compromised or abandoned after a suit was filed but before trial ( $9 \times 18$ ) would be approximately 162, and the number of claims compromised before the filing of any suit ( $20 \times 18$ ) would be approximately 360. If it is assumed that in one third of the appeal cases the defendant wins or obtains a reversal of the plaintiff's judgment, with a remand of the cause to the lower court for retrial, and that in two thirds of the appeal cases the plaintiff prevails, the latter cases would total 12. Substantial sums of money are rarely paid in settlement before a suit is filed.

These estimated numbers of claims on which money awards were made or money was paid have been tabulated (table 3); the average number of physicians in

2. I refer, of course, to materialized risk based on past experience, but this is the orthodox basis for prognosticating future risk.

Massachusetts between 1930 and 1940 was taken as 7,263. One can contrast with these the much larger group of cases in which the physician was negligent in fact or in the opinion of the patient, but the incident did not eventuate in a money settlement. The latter cases have been represented in table 4.

This analysis, tentative though it is, indicates that the risk which the average individual physician carries of

502 of these cases were appealed during the decade from 1930 to 1940 leads to the inference that in the future one may expect compensation to be demanded more often from physicians, with a transfer of many heretofore "potential" claims into the active sphere. One is also led to the conclusion that the crucial consideration for the physician is medicolegal prophylaxis. Since the instances of actually or supposedly negligent

TABLE 1.—Growth of the American Common Law in Respect to Civil

Jurisdiction	Date of First Case	Name and Citation of First Appellate Decision	Number of Cases in									
			1790-1800	1800-1810	1810-1820	1820-1830	1830-1840	1840-1850	1850-1860	1860-1870	1870-1880	1880-1890
Alabama.....	1901	McDonald v. Harris (Ala. Supreme Court, 1901) 31 So. 548, 131 Ala. 359 (Malpractice here was offered in defense in suit for fee)	..	..	..	..	..	..	..	..	..	..
Arizona.....	1926	Butler v. Rule (Ariz. Supreme Court, 1926) 242 P. 436, 29 Ariz. 403.....	..	..	..	..	..	..	..	..	..	..
Arkansas.....	1898	Keller v. Lewis (Ark. Supreme Court, 1898) 47 S. W. 759, 65 Ark. 578.....	..	..	..	..	..	..	..	..	..	..
California.....	1853	Moor v. Teed (Cal. Supreme Court, 1853) 3 Cal. 190.....	..	..	..	..	..	..	..	..	..	..
Colorado.....	1891	Burnham v. Jackson (Colo. Court of Appeals, 1891) 1 Colo. Court of Appeals Reports, 237	..	..	..	..	..	..	..	..	..	..
Connecticut.....	1791	Cross v. Guthery (Supreme Court of Errors, Conn., 1791) 2 Root 90, 1 Am. Dec. 61	1	..	1	..	1	..	..	..	..	..
Delaware.....	1935	Mitchell v. Atkins (Del. Superior Court, 1935) 173 A. 693, 6 W. Harr. 451.....	..	..	..	..	..	..	..	..	..	..
Dist. Columbia	1910	Sweeney v. Erving (D. C. Appeal Court, 1910) U. S. Sup. 1913) 35 App. D. C. 57, 43 L. R. A. (N. S.) 734 judgment affirmed 33 S. Ct., 416, 228 U. S. 233, 57 L. Ed. 815	..	..	..	..	..	..	..	..	..	..
Federal.....	1897	Ewing v. Goode (Circuit Court, S. D. Ohio, 1897) 78 Fed. 442.....	..	..	..	..	..	..	..	..	..	..
Florida.....	1934	Smith v. Zeagler (Fla. Supreme Court, 1934) 157 So. 328, 116 Fla. 628.....	..	..	..	..	..	..	..	..	..	..
Georgia.....	1860	Smith v. Overby (Ga. Supreme Court, 1860) 30 Ga. 241.....	..	..	..	..	..	..	..	..	..	..
Idaho.....	1913	Osborn v. Carey (Idaho Supreme Court, 1913) 132 P. 907, 23 Idaho 153.....	..	..	..	..	..	..	..	..	..	..
Illinois.....	1860	Ritehey v. West (Ill. Supreme Court, 1860) 23 Ill. (13 Peck) 383.....	..	..	..	..	..	..	..	..	..	..
Indiana.....	1856	Conner v. Winton (Ind. Supreme Court, 1856) 8 Ind. 315, 65 Am. Dec. 761.....	..	..	..	..	..	..	..	..	..	..
Iowa.....	1848	Bowman v. Woods (Iowa Supreme Court, 1848) 1 G. Greene 441.....	..	..	..	..	..	..	..	..	..	..
Kansas.....	1870	Tefft v. Wileox (Kan. Supreme Court, 1870) 6 Kan. 46.....	..	..	..	..	..	..	..	..	..	..
Kentucky.....	1851	Piper v. Menifee (Ky. Court of Appeals, 1851) 51 Ky. (12 B. Mon.) 469, 54 Am. Dec. 547	..	..	..	..	..	..	..	..	..	..
Louisiana.....	1901	Stern v. Lannig (La. Supreme Court, 1901) 31 So. 303, 106 La. 738.....	..	..	..	..	..	..	..	..	..	..
Maine.....	1848	Howard v. Grover (Supreme Judicial Court of Me., 1848) 28 Me. (15 Shep.) 97, 48 Am. Dec. 478	..	..	..	..	..	..	1	1	..	1
Maryland.....	1889	State v. Housekeeper (Court of Appeals of Md., 1889) 70 Md. 162, 16 Atl. 382, 2 L. R. A. 587, 14 Am. St. Rep. 340	..	..	..	..	..	..	..	..	..	..
Massachusetts.....	1853	Trombly v. Leach (Supreme Judicial Court of Mass., 1853) 65 Mass. (11 Cush.) 397	..	..	..	..	..	..	..	2	..	..
Michigan.....	1867	Hyatt v. Adams (Mich. Supreme Court, 1867) 16 Mich. 180.....	..	..	..	..	..	..	..	..	..	..
Minnesota.....	1864	Chamberlain v. Porter (Minn. Supreme Court, 1864) 9 Minn. 260 (Gil. 244).....	..	..	..	..	..	..	..	..	..	..
Mississippi.....	1915	Hood v. Moffett (Miss. Supreme Court, 1915) 69 So. 664, 109 Miss. 757, L. R. A. 1916 B. 622, Ann. Cas. 1917 E. 410	..	..	..	..	..	..	..	..	..	..
Missouri.....	1861	West v. Martin (Mo. Supreme Court, 1861) 31 Mo. 375, 60 Am. Dec. 107.....	..	..	..	..	..	..	..	..	..	..
Montana.....	1872	Coady v. Reins (Mont. Supreme Court, 1872) 1 Mont. 424.....	..	..	..	..	..	..	..	..	..	..
Nebraska.....	1883	O'Hara v. Wells (Neb. Supreme Court, 1883) 14 Neb. 403, 15 N. W. 722.....	..	..	..	..	..	..	..	..	..	..
Nevada.....	1853	Leighton v. Sargent (Superior Court of Judicature of N. H., 1853) 59 Am. Dec. 388, 27 N. H. (7 Fost.) 460	..	..	..	..	..	..	..	..	..	..
New Hampshire.....	1895	Myers v. Holborn (N. J. Court of Errors and Appeals, 1895) 53 N. J. Law (25 Vroom) 193, (and Appeals, 1895) 23 Atl. 389, 30 L. R. A. 345, 55 Am. St. Rep. 606	..	..	..	..	..	..	..	..	..	..
New Mexico.....	1916	Hobbs v. Kizer (U. S. C. C. A. N. Mex., 1916) 236 F. 681, 150 C. C. A. 13.....	..	..	..	..	..	..	..	..	..	..
New York.....	1860	Bellinger v. Craigie (N. Y. Supreme Court, 1860) 31 Barb. 534.....	..	..	..	..	..	..	..	..	..	..
North Carolina.....	1860	Woodward v. Hancock (N. C. Supreme Court, 1860) 52 N. C. 384.....	..	..	..	..	..	..	..	..	..	..
North Dakota.....	1911	Zilke v. Johnson (N. D. Supreme Court, 1911) 132 N. W. 640, 28 N. D. 75, Ann. Cases, 1913E, 1005	..	..	..	..	..	..	..	..	..	..
Ohio.....	1833	Gallaher v. Thompson (Ohio, 1833) Wright 466.....	..	..	..	..	3	..	..	..	..	..
Oklahoma.....	1906	Champion v. Keith (Okla. Supreme Court, 1906) 87 P. 815, 17 Okla. 204.....	..	..	..	..	..	..	..	..	..	..
Oregon.....	1869	Heath v. Glisson (Or. Supreme Court, 1869) 3 Or. 61.....	..	..	..	..	..	..	..	..	..	..
Pennsylvania.....	1834	Williams v. Poppleton (Or. Supreme Court, 1869) 3 Or. 139	..	..	..	..	..	..	..	..	..	..
Rhode Island.....	1904	Boydston v. Giltner (Or. Supreme Court, 1869) 3 Or. 118	..	..	..	..	..	..	..	..	..	..
South Carolina.....	1885	Bemus v. Howard (Penn. Penn., 1834) 3 Watts 255.....	..	..	..	..	1	1	2	3	..	..
South Dakota.....	1903	Bigney v. Fisher (Rhode Is. Supreme Court, 1904) 69 A. 72, 26 R. I. 402.....	..	..	..	..	..	..	..	..	..	..
Tennessee.....	1856	Hyrne v. Erwin (S. O. Supreme Court, 1855) 23 S. C. 226, 55 Am. Rep. 15.....	..	..	..	..	..	..	..	..	..	..
Texas.....	1858	Baxter v. Campbell (S. D. Supreme Court, 1903) 97 N. W. 386, 17 S. D. 475.....	..	..	..	..	..	..	..	..	..	..
Utah.....	1911	Wood v. Clapp (Penn. Supreme Court, 1856) 36 Tenn. (4 Sneed) 65.....	..	..	..	..	..	..	..	..	..	..
Vermont.....	1867	Graham v. Gautier (Tex. Supreme Court, 1858) 21 Tex. 111.....	..	..	..	..	..	..	..	..	..	..
Virginia.....	1918	James v. Robertson (Utah Supreme Court, 1911) 117 P. 1068, 39 Utah 414.....	..	..	..	..	..	..	..	..	..	..
Washington.....	1901	Wilnot v. Howard (Vt. Supreme Court, 1867) 39 Vt. 447, 94 Am. Dec. 338.....	..	..	..	..	..	..	..	..	..	..
West Virginia.....	1890	Hunter v. Burroughs (Va. Supreme Court of Appeals, 1918) 96 S. E. 369, 123 Va. 113	..	..	..	..	..	..	..	..	..	..
Wisconsin.....	1854	Miller v. Dumon (Wash. Supreme Court, 1901) 64 P. 804, 21 Wash. 648.....	..	..	..	..	..	..	..	..	..	..
Wyoming.....	1925	Kuhn v. Brownfield (W. Va. Supreme Court of Appeals, 1890) 34 W. Va. 232, 112 S. E. 619, 11 L. R. A. 700	..	..	..	..	..	..	..	..	..	..
Totals.....		Reynolds v. Graves (Wis. Supreme Court, 1854) 3 Wis. 416.....	1	..	1	..	5	3	13	25	..	..
Subtotals from beginning to end of each ten year period.....		Wright v. Conway (Wyo. Supreme Court, 1926) 211 P. 369, 35 Wyo. 1, Rehearing denied 242 P. 1107, 34 Wyo. 1	1	..	2	..	7	10	23	45	..	..

\* Included are only the opinions of appellate courts. Such opinions are published and preserved and form an addition to the common law, serving as precedents in future litigation. Not included are the far more numerous judgments of trial courts. These govern a particular case in the trial court but as a rule are not accompanied by published opinions, form no part of the preserved common law and exert but little influence as precedents.

having to pay large awards or large sums in compromise of malpractice claims is low and that the risk is a little larger in respect to intermediate and petty claims but that the great majority of actionable malpractice transactions constitute a potential reservoir, with no present payment of money involved. The fact that 1,513 cases have reached the appeal courts of the United States during the period from 1794 to 1940 but that

conduct are for the most part potential claims only, the interest of the physician lies in the direction of keeping them potential. This he can do in large measure by keeping adequate records, by holding himself in all respects to the level of practice in his community and by keeping in mind the medicolegal bearings of transactions which he must learn to recognize as involving hazard.

In other words, I wish to reiterate the assertion made in part I of this study that it behooves the physician to know the pattern of his legal position as well as possible.

Courts of all states, in evolving the law represented by the 1,513 appeal cases, have depended almost entirely on principles of common law, with free and constant reference to the decisions of sister states. The principles

a rapidly rising incidence may indicate the operation of a variety of factors, as for instance:

1. Increasing expectations directed toward physicians as medical standards advance and the public becomes informed of what is medically possible.

2. Trends toward urbanization, with its several consequences, such as: (a) the increase in "transient" patients of unknown temperament; (b) higher standards

### *Liability of Physicians and Surgeons for Medical Malpractice\**

Ten Year Periods										Rank in Popu- lation	Rank in No. of Cases	Settled	Entered Union	Area, Square Miles	Popu- lation, <sup>†</sup> April 1, 1930	Percentage of Total Popu- lation <sup>†</sup>	Percentage Urban		Estimated Population, July 1, 1937
1870- 1880	1880- 1890	1890- 1900	1900- 1910	1910- 1920	1920- 1930	1930- 1940	Total												
..	..	..	1	8	17	10	36	16	17	1702	Dec.	14, 1819	51,998	2,616,248	2.2	21.7	28.1	2,895,060	
..	..	..	..	..	2	2	4	45	47	1580	Feb.	14, 1912	113,956	435,573	0.4	35.2	34.4	412,000	
..	..	1	2	4	9	3	19	23	27	1085	June	15, 1836	53,335	1,854,482	1.5	16.6	20.6	2,048,000	
..	1	1	4	15	21	60	103	6	1	1769	Sept.	9, 1850	158,297	5,677,251	4.6	68.0	73.3	6,151,000	
..	..	1	1	7	2	8	19	33	27	1858	Aug.	1, 1876	103,948	1,035,791	0.8	48.2	50.2	1,071,000	
..	..	2	..	1	5	12	23	28	25	1635	Jan.	9, 1788	4,965	1,606,903	1.3	67.8	70.4	1,741,000	
..	..	..	..	..	..	1	1	37	48	1726	Dec.	7, 1787	2,370	238,580	0.2	54.2	51.7	261,000	
..	..	..	..	3	5	7	15	39	32	....	.....	.....	....	486,867	0.4	100.0	100.0	627,000	
..	..	..	2	6	2	5	15	..	..	1550	March	3, 1845	58,666	1,468,211	1.2	36.7	51.7	1,670,000	
..	..	..	..	..	..	5	5	30	45	1733	Jan.	2, 1788	59,265	2,908,606	2.4	25.1	30.8	3,085,000	
..	..	..	4	6	13	18	42	13	13	1842	July	3, 1890	83,888	445,032	0.4	27.6	29.1	493,000	
..	..	..	..	4	3	6	13	43	37	1720	Dec.	3, 1818	56,065	7,630,654	6.2	67.9	73.9	7,678,000	
8	1	5	12	27	7	15	78	3	4	1723	Dec.	11, 1816	36,354	3,238,603	2.6	50.6	55.5	3,474,000	
5	9	7	4	5	6	7	46	12	11	1788	Dec.	28, 1846	56,147	2,470,939	2.0	36.4	39.0	2,552,000	
4	2	8	11	18	12	8	65	20	6	1727	Jan.	29, 1861	82,158	1,880,000	1.5	34.9	38.8	1,864,000	
2	..	2	3	4	13	5	29	36	20	1765	June	1, 1792	40,503	2,614,589	2.1	26.2	30.6	2,920,000	
..	2	1	7	9	12	13	45	15	12	1639	April	8, 1812	48,506	2,101,593	1.7	34.0	39.7	2,132,000	
3	2	3	1	8	1	5	26	35	23	1624	March	15, 1820	33,040	797,423	0.6	39.0	40.3	855,000	
..	1	2	1	1	8	3	11	30	40	1634	April	23, 1788	12,327	1,631,526	1.3	60.0	59.8	1,679,000	
2	2	2	3	5	10	18	50	8	10	1620	Feb.	6, 1788	8,266	4,249,614	3.5	94.8	90.2	4,425,000	
2	5	5	5	10	8	22	59	7	8	1650	Jan.	26, 1837	57,980	4,842,325	3.9	61.1	68.2	4,808,000	
3	1	2	4	14	19	17	61	19	7	1605	May	11, 1858	84,682	2,563,953	2.1	44.1	49.0	2,644,000	
..	..	..	..	2	3	2	7	24	41	1716	Dec.	10, 1817	46,865	2,609,821	1.6	15.4	16.9	2,616,000	
..	5	3	8	21	33	20	91	9	3	1764	Aug.	10, 1821	69,420	3,629,367	3.0	46.0	51.2	3,975,000	
2	..	1	..	1	8	3	15	40	32	1809	Nov.	8, 1829	146,997	537,606	0.4	31.3	33.7	539,000	
..	2	6	3	4	0	7	27	32	22	1847	Feb.	9, 1867	77,520	1,377,663	1.1	31.3	35.3	1,365,000	
..	..	..	..	..	..	..	0	49	49	1850	Oct.	31, 1864	110,690	91,038	0.1	19.7	37.8	101,000	
2	..	2	2	2	1	2	13	42	37	1623	June	21, 1788	9,341	465,293	0.4	63.1	58.7	509,000	
..	..	1	1	3	9	11	25	9	24	1664	Dec.	18, 1787	8,224	4,041,234	3.3	78.4	82.6	4,336,000	
..	..	..	..	1	..	..	1	44	48	1537	Jan.	6, 1912	122,674	423,317	0.3	18.0	25.2	422,000	
4	8	11	6	10	14	32	96	1	2	1614	July	26, 1788	49,204	12,588,060	10.3	82.7	83.6	12,948,000	
..	..	2	1	4	3	18	29	12	20	1650	Nov.	21, 1789	52,426	3,170,276	2.6	19.2	25.2	3,476,000	
..	..	..	..	4	6	8	13	36	30	1780	Nov.	2, 1829	70,837	680,845	0.6	13.6	16.6	705,000	
2	1	1	1	5	12	11	38	4	16	1788	March	1, 1803	41,040	6,646,097	5.4	63.8	67.6	6,724,000	
..	..	..	2	4	9	16	31	21	18	1889	Nov.	16, 1907	70,057	2,396,040	2.0	26.6	34.3	2,539,000	
..	..	1	1	3	10	12	30	34	19	1838	Feb.	14, 1859	96,699	9,53,766	0.8	49.9	51.3	1,022,000	
3	1	1	5	6	6	13	42	2	13	1682	Dec.	12, 1787	45,126	9,631,350	7.8	64.3	67.8	10,158,000	
..	..	..	4	2	1	1	8	38	41	1636	May	29, 1790	1,243	657,497	0.6	97.5	92.4	681,000	
..	1	1	..	1	2	1	6	27	43	1670	May	23, 1788	30,989	1,758,765	1.4	17.5	21.3	1,860,000	
..	..	..	1	..	6	5	12	37	37	1794	Nov.	2, 1829	77,615	692,849	0.6	16.0	18.9	692,000	
..	..	..	1	2	7	10	21	17	26	1757	June	1, 1796	42,022	2,616,556	2.1	26.1	34.3	2,893,000	
1	..	1	..	5	13	18	39	5	15	1686	Dec.	29, 1845	265,896	5,824,715	4.7	32.4	41.0	6,172,000	
..	..	..	..	2	4	8	14	41	35	1847	Jan.	4, 1896	84,990	507,847	0.4	48.0	52.4	519,000	
..	..	..	..	2	1	3	6	18	43	1607	June	25, 1788	42,627	2,421,851	2.0	29.2	32.4	2,706,000	
1	..	..	5	3	2	2	14	46	35	1724	March	4, 1791	9,564	359,611	0.3	31.2	33.0	383,000	
..	..	..	5	28	18	21	72	31	5	1811	Nov.	11, 1889	69,127	1,503,396	1.3	55.2	56.6	1,658,000	
..	..	2	2	1	4	6	15	25	32	1727	June	20, 1863	24,170	1,729,205	1.4	25.2	28.4	1,865,000	
1	3	3	2	11	21	11	54	14	9	1670	May	20, 1848	56,066	2,939,006	2.4	47.3	52.9	2,926,000	
..	..	..	..	..	3	2	5	48	45	1834	July	10, 1890	97,914	225,565	0.2	29.5	31.1	225,000	
43	47	77	116	292	386	502	1,513	..	..	..	.....	.....	.....	122,775,046	100.0	....	....	129,114,000	
93	140	217	333	625	1,011	1,513	..	..	..	..	.....	.....	.....	..	..	..	..	..	..

† Rate of increase in the population of continental United States: 1790 to 1800, 25.1 per cent; 1800 to 1810, 36.4 per cent; 1810 to 1820, 38.0 per cent; 1820 to 1830, 33.5 per cent; 1830 to 1840, 32.7 per cent; 1840 to 1850, 35.9 per cent; 1850 to 1860, 35.6 per cent; 1860 to 1870, 26.6 per cent; 1870 to 1880, 26.0 per cent; 1880 to 1890, 25.5 per cent; 1890 to 1900, 20.7 per cent; 1900 to 1910, 21.0 per cent; 1910 to 1920, 14.9 per cent, and 1920 to 1930, 16.1 per cent. The number of physicians in continental United States in 1946, according to figures gathered by the American Medical Association, was 165,167, of which number 24,013 were in New York; 12,889, in Pennsylvania; 11,672, in Illinois, and 10,859, in California. The number of medical graduates in 1937 was 9,767, as against 8,691 in 1936 and 8,011 in 1935. The annual number has not fallen below 7,000 since 1924, when the total was 6,671.

\* Rural population means under 2,500.

of law applicable to physicians have been substantially alike in the several states, so that only in an occasional situation does the physician have a liability in one state which he would not have in another. It seems that this variation does not affect the incidence of malpractice appeals. I do not overlook the fact, however, that

of practice; (c) the difficulty in maintaining the degree of physician-patient intimacy which exists in rural communities or small towns; (d) the increased number of industrial hazards, of cases of fractures and of other transactions which carry greater risk of malpractice; (e) the availability of a larger body of physicians to



draw from to serve as expert witnesses in making the necessary proof, and (f) the availability of a larger bar, with a greater chance of finding an attorney willing to handle the claim.

3. Advent of new diagnostic instrumentalities, such as the roentgen rays, which cause previously unsuspected or latent negligence to become patent.<sup>3</sup>

TABLE 2.—Incidence of Appeal Cases of Civil Malpractice in Jurisdictions of the United States According to Population and Number of Physicians

State or Jurisdiction	Total Cases 1794 to 1940		Total Cases 1930 to 1940		Cases per Million Population 1930 to 1940		Cases per Physician 1930 to 1940	
	No.	Rating	No.	Rating	No.	Rating	No.	Rating
Alabama.....	36	17	10	20	3,454	30	0.0046	16
Arizona.....	4	47	2	31	4,854	21	0.0039	22
Arkansas.....	10	27	3	37	1,464	42	0.0015	38
California.....	103	1	60	1	9,749	7	0.0055	12
Colorado.....	19	27	8	23	7,469	9	0.0041	19
Connecticut.....	23	25	12	15	6,892	11	0.0049	15
Delaware.....	1	48	1	46	3,601	26	0.0031	30
Dist. Columbia.....	15	32	7	27	11,164	6	0.0035	24
Federal courts.....	15	..	5	..	..	..	..	..
Florida.....	5	45	5	32	2,004	33	0.0025	39
Georgia.....	42	13	18	6	5,834	14	0.0065	9
Idaho.....	13	37	6	30	12,178	3	0.014	2
Illinois.....	78	4	15	12	1,904	39	0.0012	41
Indiana.....	46	11	7	27	2,014	38	0.0017	37
Iowa.....	65	6	8	23	3,134	32	0.0025	32
Kansas.....	20	20	5	32	2,682	35	0.0022	35
Kentucky.....	45	12	13	13	4,442	23	0.0046	16
Louisiana.....	19	27	9	22	4,221	24	0.0042	18
Maine.....	26	23	5	32	5,817	15	0.0052	13
Maryland.....	11	40	3	37	1,786	40	0.0010	43
Massachusetts.....	50	10	18	6	4,067	25	0.0024	34
Michigan.....	59	8	22	3	4,575	22	0.0037	23
Minnesota.....	61	7	17	10	6,428	12	0.0051	14
Mississippi.....	7	41	2	41	0,902	46	0.0013	39
Missouri.....	91	3	20	5	5,031	20	0.0032	28
Montana.....	15	32	3	37	5,565	16	0.0062	11
Nebraska.....	27	22	7	27	5,128	19	0.0039	20
Nevada.....	0	49	0	49	0,000	48	0.0000	48
New Hampshire.....	13	37	2	41	3,929	26	0.0033	26
New Jersey.....	25	24	11	17	2,536	36	0.0021	36
New Mexico.....	1	48	0	49	0,000	48	0.0000	48
New York.....	96	2	32	2	2,471	37	0.0013	39
North Carolina.....	29	20	18	6	5,172	18	0.0070	8
North Dakota.....	18	30	8	23	11,347	5	0.015	1
Ohio.....	35	16	11	17	1,619	41	0.0012	41
Oklahoma.....	31	18	10	11	6,301	13	0.0065	9
Oregon.....	30	19	12	15	11,741	4	0.0089	5
Pennsylvania.....	42	13	13	13	1,278	44	0.0010	43
Rhode Island.....	8	41	1	46	1,453	43	0.0010	43
South Carolina.....	6	43	1	46	0,537	47	0.0007	47
South Dakota.....	12	37	5	32	7,225	10	0.0088	6
Tennessee.....	21	26	10	20	3,473	29	0.0034	25
Texas.....	39	15	18	6	2,916	34	0.0026	31
Utah.....	14	35	8	23	15,414	1	0.014	2
Vermont.....	6	43	3	37	5,221	17	0.0039	20
Virginia.....	14	35	2	41	1,193	45	0.0010	43
Washington.....	72	5	21	4	12,665	2	0.010	4
West Virginia.....	15	32	6	30	3,217	31	0.0033	26
Wisconsin.....	54	9	11	17	3,759	27	0.0052	28
Wyoming.....	5	45	2	41	8,510	8	0.0076	7

4. The sheer number of cases in a community or a state, with their varying degrees of publicity, which may create a public awareness of medical responsibility in law.

5. Encouragement to suit afforded by the presence of malpractice insurance. Though it is a reversible error, as a consideration calculated to bias the jury, for the plaintiff to disclose in the course of a trial that the defendant has malpractice insurance, the plaintiff's lawyers usually have means of discovering the presence of such insurance. Obviously, a plaintiff is more apt to sue when he is sure that any judgment obtained will be collectible, and he is less apt to compromise for as small a sum as he might accept from an unprotected defendant of limited financial resources.

6. Industrialization of certain areas.

3. Roentgenograms were pressed into service as medical evidence soon after Roentgen's discovery of x-rays. The first American case in which they were offered seems to have been *Smith v. Grant*, 29 Chicago Legal News, 145, Dec. 3, 1896.

7. Presence of hazardous occupations in a given area, as for instance the numerous cases of fractures apt to be encountered in certain western states in connection with "logging" camps or in states with high automobile collision rates.

TABLE 3.—Malpractice Claims on Which Money Was Awarded or Paid in Massachusetts Between 1930 and 1940

	Number	Average Amount Involved	Rate per 1,000 Physicians *	
			For 10 Yr.	For 1 Yr.
Appeal cases.....	12	\$1,000 or more	1.65	0.165
Trial court judgments settled before appeal †	54	\$500 or more	7.43	0.743
Claims compromised after suit was filed but before trial †.....	162	\$100 to \$1,000	22.30	2.230
Petty claims compromised before suit was filed, either by paying money or by cancelling bill †.....	360	\$3 to \$200 (occasionally higher)	49.50	4.950
Total.....	588		80.88	8.088

\* The average number of physicians in Massachusetts between 1930 and 1940 was 7,263.

† Estimated number.

8. Flux or rapid change in the population, particularly with reference to newcomers, strangers and transients in the community. Such factors seem to play some part in the increasing tide of malpractice cases in California.

9. Possible shift of policy on part of defendants from early settlement to "last ditch" fight in appellate courts. Clearly, if defendants resolve to carry most cases involving \$1,000 or more to an appeal court as a matter of course, such a policy of protracted litigation may cause the number of appeal cases to rise out of all proportion to the increase in the number of underlying malpractice situations. To determine the effect of this factor one would need a statement from malpractice

TABLE 4.—Instances of Negligence by a Physician, in Fact or in the Opinion of the Patient, in Massachusetts Between 1930 and 1940 Which Did Not Eventuate in a Money Settlement

	Number *	Amount Involved	Rate per 1,000 Physicians †	
			For 10 Yr.	For 1 Yr.
Cases won by physicians in trial courts; claim against physician considered but abandoned without active assertion (100 × 18).....	1,600	Varies widely; usually small	218	21.8
Instances in which the physician was negligent in fact or in the opinion of the patient, but no consequence ensued except, perhaps, a loss of good will or a change of patronage (1,000 × 15).....	18,000	Varies widely; usually small	2,490	249.0
Total.....	19,600			

\* Estimated.

† The average number of physicians in Massachusetts between 1930 and 1940 was 7,263.

insurance carriers (so far not forthcoming) as to how many of the cases appealed since 1900 were taken up by companies and a statement of the number of large (not petty) claims compromised by payment of substantial sums as compared with the number of such claims carried to the appeal courts before payment. Such data might explain in part the inordinate per-

centage increase in appeal cases over the percentage increase in physicians and in population from 1900 to 1940.

It is not my intention to place a mathematical valuation on these factors, which seemingly account for the rise in the number of malpractice cases reaching American appeal courts. In each community they may have a different relative importance. Also, each local practitioner will know what peculiar or additional factors have a bearing on the malpractice problem in his own community.

The tables are offered as a statement, accurate within a small range of error, of the incidence of malpractice appeal cases. The reader is invited to interpret these data as he sees fit and even to apply different multiples to ascertain the lower tiers of the malpractice "pyramid" if he has more accurate information as to ratios in his particular locality. My inferences seem to fit in with the data available and are put forward to replace the fog of conjecture as to the size of the malpractice problem with at least a crude approximation of objective fact. Should insurance carriers be able to show by authenticated records the need for revision of some of these inferences, it might become necessary to reconsider certain statistical aspects of the problem in a later publication.

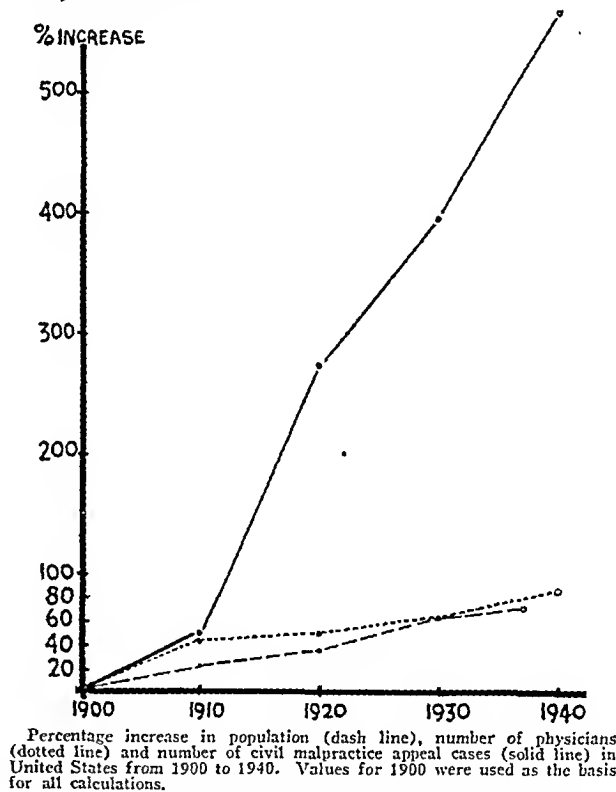
It would be interesting to the medical profession to know whether malpractice insurance merely relieves against the annoyance of petty claims and what the odds are that the physician in taking a policy buys a ticket for a long journey through the appellate courts because of the larger malpractice claims which may be urged against him. Some malpractice cases have been to the appeal courts two and three times and have been kept in litigation for as long as fifteen years. Naturally, under the ordinary insurance policy, the sole discretion as to whether a claim shall be compromised or defended rests with the insurer, and the physician may at times have to cooperate in a defense contradicted by his better judgment or have his protection forfeited. This is a serious problem in regard to all malpractice insurance written by private companies, for the economic interest of the carrier may well be advanced by vigorous defense and protracted litigation. The physician may have an opposing interest in early compromise as a means of conserving his time and protecting his reputation against too long a sojourn in the courts. Whether these two interests can be reconciled with fairness to both the physician and the insurer will determine the success of their mutual relations and will enable the physician to decide for himself the value of a proposed insurance coverage.

It seems significant that between 1615, when the decision was reached in the case of *Everard v. Hopkins*, first of the modern malpractice cases in English law, and 1940 a total of less than 100 cases have come before the appeal courts of the British empire. This bears comment since the doctrines of medical responsibility under English law are quite similar to those applied in the United States, and a plaintiff has like rights of access to the courts and like powers of appeal. I make this comparison with reservation, since the volume of American appeal cases on all subjects exceeds that of the British. Yet the fact that in certain years between 1930 and 1940 no malpractice cases reached the British appeal courts, with only a handful for the ten years as contrasted with 502 in the United States, seems to bespeak a profound difference in the

way the malpractice problem is being handled in the British empire and the way it is handled in the United States.

In summing up, one gains the impression that the malpractice hazard varies considerably in different sections of the United States. The physician should consult the tables to get an idea of the incidence of appeal cases (the controversies involving large sums worth fighting over) both per physician and per million of population in his state. He will then ask himself the following questions:

1. Am I engaged in hazardous practice, such as work with fractures, the practice of surgery or obstetrics, the diagnostic or therapeutic use of roentgen rays or other types of work calling for dramatic changes of the patient's status quo or affirmative action as compared with more cautious watchful waiting? If so, my average risk may be larger than the crude rate; if not, it may be even smaller.



2. Am I located in a community carrying special risks of injury or showing heavy industrialization? Is my practice to a large extent made up of patients who are transient, "unknown" or strangers, or is it a select practice among conservative people of known stability who would be slow to assert a claim of negligence?

3. Am I practicing in a large urban center with more impersonal relations to patients than a rural or small town practitioner enjoys?

4. Am I equipped with the knowledge, judgment, care and skill possessed by fellow practitioners of my community who belong to the same group (such as general practitioner or specialist) and to the same "school of medicine"? Am I able to apply these qualities consistently in the contacts I have with patients?

5. Am I subject in my practice to the risk of fraudulent claims by persons of unknown temper or moral character?

6. Am I conversant with the more important principles governing my legal position, so that I can avoid future trouble by taking pertinent precautions in advance?

In addition to the large group of transactions already mentioned in which the patient is the moving actor, another large group exists in which alleged malpractice is put forward as the ground for refusal to pay a medical bill. Most courts hold that a medical contract is "entire" and not "separable." Therefore, the negligence of a physician in any phase of a continuous treatment defeats his whole bill and not merely the charge for the negligent visit. When the physician files suit for services rendered, the patient may plead malpractice in defense. He may go still further and in the same case file a counter claim for affirmative damages. In such event, he becomes plaintiff in respect to the counter claim, and the physician becomes defendant. In effect, these are two separate cases being tried together: the main action for the medical fee and the counter claim, or so-called "cross action," for malpractice. This procedure is justified on the ground that since both controversies arise out of the same transaction all disputed questions can be settled conveniently in a single proceeding without multiplicity of suit. Sometimes, an unscrupulous patient threatens to plead "malpractice" if sued for his bill, trafficking on the natural desire of the physician to avoid aspersions against his professional conduct.

Every malpractice contention will present itself either as (1) an affirmative claim by a patient, which may be (a) a bona fide assertion or (b) fraudulent or so wholly lacking in foundation as to compel the inference that the patient is acting in bad faith, or (2) a "defensive" claim set up in opposition to the physician's bill for services rendered, to which either (a) or (b) may apply.

The physician should distinguish carefully between the bona fide and the unconscionable type of case, for the two types fall into different categories, both legally and morally. Moreover, from the standpoint of practical trial strategy, one must never forget that the favorite sport of average jurors is to unmask fraud; their one predictable allegiance is to their instinctive or formulated conception of what would be a "square deal" on the merits. Psychologically, this sometimes turns on a subconscious vindication of their own inherent decency. Juries of high or of low moral caliber tend to follow this consideration with amazing uniformity, as a sort of compass in the fog of disputed fact. Let the fact come home to a jury, through the evidence or through inescapable psychologic impressions, that the moving party behind a contention seeks unjust enrichment by a false claim or by a fraudulent trick or device, and the reaction of the jurors is promptly to hock the way by adverse fact findings in their verdict. Hence, in cases tinged with fraud, the attorney for the physician has a brilliant opportunity for a crushing cross examination and exposure of the adverse litigant's true position.

When a physician has done his best, in conduct prosecuted with good faith, he may be tempted to look on the assertion of negligence by a patient as a fraudulent imposition. But the law does not force the patient to assume all the risks any more than it requires the physician to be a guarantor of treatment. If there is a substantial ground on which a patient can reasonably believe he has suffered from the negligence of another, even though he is mistaken, the law has an interest in

protecting his free access to the courts so that the bona fide issue may be tried. The very purpose of the courts is to settle such disputes as fairly as possible. The purse-sparing propaganda that a physician must fight every malpractice claim to save the "honor" of the medical profession has often clouded clear thinking. It has led to the defense of more than one claim which should have been compromised. The ordinary case of civil malpractice does not involve moral turpitude but is an action seeking compensatory damages for simple negligence; every case is not an "indictment" of the medical profession which calls for the cooperation of all good practitioners in saving the common honor whatever the merits of the claim.

When, on the other hand, a claim is asserted fraudulently, though the law cannot cut off the plaintiff's right of access to its tribunals without prejudging the very question to be tried, a new question is presented. The patient in such case is trying to use the courts as a vehicle for his fraud and unjust enrichment. Physicians and lawyers who knowingly espouse such causes should be reprimanded and regulated by their professions. Thought should also be given to the question of whether the medical profession should not support proper legislation to confer on trial court judges, in event of the finding that the claim was asserted fraudulently or without any bona fide foundation, the discretionary power to tax against the offending party not only court costs but an allowance to the injured party for reasonable attorney's fees and compensation for expense and loss of time. At present, even if the physician prevails in such a case, the judgment in his favor causes only the bare court costs to be taxed against the plaintiff. There are no uniform state statutes allowing him to recover a further amount to cover his reasonable attorney's fee and expenses of litigation.<sup>4</sup>

The law has always abhorred any rule which might intimidate a citizen in the assertion of a legal right or deter him from having his day in court. This policy is manifested in several ways. Thus, whatever a litigant says in pleading his case or as a witness is privileged and cannot be made the foundation of an action for libel or slander by an opposing litigant who claims his reputation has been injured thereby.<sup>5</sup>

More debatable, therefore, is the question whether injury to the physician's professional reputation by the filing of a groundless suit could properly be made the subject of special damages. The suggested legislation, alone, might well deter the assertion of many "nuisance value" claims.

It is true that a witness who falsifies while under oath in a civil proceeding may later be prosecuted criminally for perjury. Yet, since such prosecution is a criminal law proceeding, the indictment needs to be proved beyond a reasonable doubt; and for a number of reasons, abuse of civil proceedings by a fraudulent plaintiff cannot be adequately dealt with by this method.

The problem of the "nuisance value" case is one of the most pressing of the law's unsolved problems. It is not peculiar to cases affecting physicians. All such cases rest on a common formula: X with a groundless or unsubstantial claim, on the merits of which even he does not expect to prevail, files a suit against Y. Y must answer and defend or suffer a default judgment. The

4. McCormick, C. T.: *Handbook on the Law of Damages*, St. Paul, West Publishing Company, 1935, p. 234.

5. On proper motion in advance of trial, judges will strike out frivolous, scurrilous or malicious pleadings, visibly intended to discredit the other party and not to serve as a basis for proposed proof. Again, trial courts will prevent the introduction of testimony of like character on timely motion by the offended party.

trial will involve time and expense, and Y's attorney's fee to defend the case will be, for example, \$300. Even if Y wins, he cannot recover the attorney's fee. X offers to compromise for \$200. Under such an arrangement, Y is not making a compromise settlement of a "bona fide" equity. Lawyers who knowingly espouse such claims are reprehensible. Fortunately, few will do so, but the door is open to considerable hardship in the case of the physician, for he must consider not only the relative costs of the alternative courses of action but the undesirable effect a suit may have on his professional status.

The statute suggested would need to be drawn to conform to constitutional guarantees. The main requirement of similar legislation was held by the United States Supreme Court, in *Missouri, K. & T. Ry. Co. of Texas v. Cade* (233 U.S. 642, 34 S. Ct. 678, 58 L. Ed. 1135-1914), to be the avoidance of discrimination against persons affected, under the "equal protection" clause of the federal constitution.<sup>6</sup>

#### EVOLUTION OF A FORMULA FOR TESTING THE LEGAL SUFFICIENCY OF A MALPRACTICE CLAIM

In the face of this large and growing body of malpractice law, is it possible to get away from the confusing minutiae of individual cases and evolve a formula which will fit them all? Invaluable as reviews of current cases may be, the physician is still in need of a critique by which all malpractice situations may be judged. If this paper can convey to him a reasonable rationale, its purpose will be fulfilled. Its object is thus to orientate the subject rather than to exhaust it.

The method used to arrive at a formula has been to analyze a large number of cases in the light of this inquiry: What are the irreducible essentials of all malpractice actions?

Suppose the defendant, after filing an answer to a malpractice action, sits back and says: "Let the plaintiff prove a case if he can." The minimum legal components which an unopposed plaintiff must prove by a preponderance of the evidence to entitle him to recovery may justly be called the essentials of plaintiff's prima facie case.

In dealing with the law of malpractice, if the non-essential language of the decisions and collateral considerations is pushed aside, one finds that these minimum legal components necessary to support recovery may be stated for all transactions as: (1) duty (due from defendant to plaintiff), plus (2) breach of duty, plus (3) proximate causation, plus (4) injury to plaintiff (damage). These may be recast into a formula easier to keep in mind: (1) duty, plus (2) dereliction, plus (3) direct causation, plus (4) damage.

If the physician will hold fast to the individual identity and the indispensability of each of these four components, the "four D's," he will be able to break down and understand any malpractice problem. This is a fundamental point of departure, and much of what follows will be an elaboration of these telescoped concepts.

6. Amendment XIV. Constitution of the United States: "Article XIV, Section 1: All persons born or naturalized in the United States, and subject to the jurisdiction thereof, are citizens of the United States and of the State wherein they reside. No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."

#### DUTY

*Example.*—Plaintiff, X, proves dereliction, direct causation and damage and rests his case.

The evidence shows that X one day was riding on a subway train. He fell into informal conversation, without introductions, with Y, a pleasant gentleman sitting next to him. X volunteered that he had long been suffering from constant, severe headaches which acetylsalicylic acid did not help. Y remarked that he had known of some cases in which such pain was relieved only by aminopyrine. X, chancing to look down at a case carried by his new acquaintance, saw embossed in gold thereon, "John J. Johnson, M.D., City Hospital." That night he had his cousin, an employee in a drug store, send him some aminopyrine. This drug afforded delightful relief, and he continued to take it daily. Severe granulocytopenia developed, with resulting physician's bills and loss of time from work.

For these damages, X files suit against Y. He offers medical testimony showing that the aminopyrine was the probable cause of the granulocytopenia and that prudent local practice calls for its administration in regulated amounts and with periodic studies on the blood. The plaintiff also offers evidence that the physician's bills and expenses incurred in his treatment were reasonable and testimony establishing his loss of earnings during the sickness. Thereupon, he rests his case. The defendant offers no evidence but files a motion for an instructed verdict asserting that the plaintiff has not made out a prima facie case of malpractice entitling him to go to the jury.

The court must instruct a verdict for the defendant, Y. Y made his remarks in a casual way and not in his identity as a physician or for the specific reliance of X. He was not putting forward his information in a professional way. The information imparted was general and not of the specific quality of personal medical advice.

Clearly, no implied contract of employment was intended by either party. X had no notion of engaging Y in a professional capacity nor Y of making a charge, nor could it be said that Y by his remarks undertook the gratuitous treatment of X as his patient. From the revealed circumstances, no duty can be made out, and the plaintiff's case must therefore fail.

(But note that such duty, and therefore a prima facie case, would arise if the facts were slightly different. Suppose the following is the case: X looks at the bag of Y and says: "Oh, I see you are Dr. Johnson," and explains his ailment and impecunious condition. Y says: "Look here, my friend, come down to the outpatient department, and I shall treat you gratis." Thereafter Y administers aminopyrine in a negligent manner to X as a gratuitously treated outpatient. Y may be liable for malpractice.)

#### DERELICTION

*Example.*—Plaintiff, X, proves duty, direct causation and damage and rests his case.

The evidence shows that X, a concert violinist, sustained a Colles fracture of the left radius and a fracture of the scaphoid bone when he fell while skating on the ice. He called Y, who reduced and set the fractures, but a poor recovery followed, with final deformity and limitation of the movements of the hand, which incapacitated X as a musician.

He files suit against Y. He offers evidence of the damage sustained through loss of earning power. He offers medical testimony that the function of his left

hand and its fingers has been impaired permanently. He testifies in his own behalf as to the stiffening of his wrist and his inability to play his instrument successfully. Other musicians give supporting evidence that he has lost his previous delicate fingering, so essential in rendering difficult compositions. The plaintiff thereupon rests, and defendant files a motion for an instructed verdict.

The court must instruct a verdict for the defendant, Y. X has not made out a prima facie case, for he has failed to prove dereliction or fault. The law does not make Y an insurer or guarantor that his treatment will be successful. He is responsible only for negligence, and when negligence depends on a medical dereliction it cannot be proved by lay testimony; its proof requires the evidence of qualified experts. The bad result of treatment, if extreme, may constitute some evidence of negligence but not enough to satisfy plaintiff's burden of proof on his prima facie case. It will not carry the case to the jury, for the reason that a trial court or appellate court could not permit a jury verdict of negligence to stand when based on evidence of the result of treatment alone.<sup>7</sup>

When evidence is so unsubstantial that reasonable men could not found a verdict on it, the trial court, on timely motion, has a duty to take the case from the jury and instruct a verdict against the party failing on his burden of proof. Conversely, if a plaintiff offers such strong testimony, not contradicted by credible evidence, that no reasonable man could find to the contrary, the trial court (on timely motion) has a duty to instruct a verdict for the plaintiff. If by oversight or through mistaken judgment the trial judge submits a case to the jury when the evidence is insufficient to support a verdict for the plaintiff (or vice versa), he may rectify the error after verdict by granting a new trial. In some states he may enter judgment notwithstanding the verdict ("judgment non obstante veredicto") in favor of the party who was entitled to an instructed verdict in the first instance. Suppose, for example, a plaintiff has made out a prima facie case of malpractice, while the defendant has not offered prima facie evidence making out a defense. The plaintiff files a motion for an instructed verdict, which the court overrules, permitting the case to go to the jury. A verdict is returned for the defendant, and the plaintiff files motion for judgment "notwithstanding the verdict," which the trial court denies, entering judgment instead in favor of the defendant. On appeal by the plaintiff, the higher court is entitled to say: "Whether there was sufficient evidence on the part of defendant to create a disputed issue of fact warranting submission to the jury presents a question of law and is, therefore, a proper subject for our review. Only jury findings of disputed fact are binding on us." The appeal court accordingly will reverse and render the judgment, taking it away from the defendant and awarding it to the plaintiff (or vice versa, as the case may be). In event the jury has not returned findings on the amount of damages, the higher court may simply reverse and remand the case for a new trial. In any event, it is clear law that an appeal court has power to disturb a judgment on the ground that the verdict on which it depends rests on evidence too unsubstantial to warrant a reasonable man's basing fact findings on it.

7. A rare exception exists in cases to which the doctrine of "res ipsa loquitur" applies, but its application is admitted by so few courts and restricted to such exceptional cases that the subject may be passed by for the time being.

#### DIRECT CAUSATION

*Example.*—Plaintiff, X, proves duty, dereliction and damage and rests his case.

X's evidence shows that her husband, Z, received a mortal injury to the brain in an automobile collision. He was taken to a police station in a nearby town. Y, the police surgeon, examined the unconscious man, found no evidence of the damage to the brain, entered a diagnosis of intoxication and left him overnight at the station house, negligently failing to put him in a nearby hospital, where roentgenograms and lumbar punctures would have revealed the condition. Y had been told that Z had been unconscious for over an hour as the result of a bad automobile crash. A day later Z was taken to his home, where he was attended for four days by a local physician. On failure to improve, he was transferred to a hospital, where the correct diagnosis was established. He was in a moribund condition and died within seventy-two hours of admission.

X, the surviving spouse, files suit against Y, seeking damages for wrongful death. After introducing the foregoing evidence in support of her allegations of negligence, X rests her case. Y files a motion for an instructed verdict.

The court must grant an instructed verdict for Y. It is not enough that a plaintiff shows dereliction and damage; he must show a causal relation between the two. When the injury in respect to which the physician is negligent is itself a sufficient cause of the damage, as the death here, the plaintiff has the burden of showing that the physician's dereliction was a substantial contributing cause. In this case the plaintiff would need to prove that had Y exercised due care and referred Z to the hospital because of the story of trauma and the continuing unconsciousness, probably Z's life could have been saved. Such likelihood is a prognosis dependent on expert knowledge and so would need to be shown through the testimony of qualified physicians. Having failed in such proof of causation, X has not made out her prima facie case. The jury cannot be allowed to rest a verdict on mere supposition or surmise or to compensate X in respect to an injury (death of her husband) which, from all the evidence shows, was as likely to have resulted irrespective of Y's negligence and despite the best of care. (*Ramberg v. Morgan* [Supreme Court of Iowa] 1928, 218 N.W. 492 is an actual case so holding).

#### DAMAGE

*Example.*—Plaintiff, X, proves duty, dereliction and direct causation and rests her case.

The evidence shows that X, being pregnant and feeling labor pains, called in physician Y. After a time, seeing that progress was slow, Y said that he would go away for an hour and return. Instead, he negligently absented himself for four hours. After his return an uneventful delivery was effected, with prompt convalescence of the mother. X, joined by her husband, sues Y for mental anguish and apprehension, which, she said, resulted from her terror of an imminent birth during Y's prolonged and unjustifiable absence.

After offering evidence in support of these allegations, plaintiff rests her case, praying for \$5,000 damages. Defendant, Y, files a motion for an instructed verdict.

The court must instruct a verdict for the defendant. The American courts do not permit the recovery of damages for so-called shock or mental anguish



unattended by any actual injury.<sup>8</sup> Such damages are regarded as too speculative for fair ascertainment. If the dereliction were to be considered a breach of contract, nominal damages (1 cent or 1 dollar) could be ordered entered by the court for the plaintiff, and in some states this would cause court costs to be taxed against the defendant. But the better view, and the one which it is believed the majority of courts would take, is that the contract of employment merely raises the duty of the physician, while its breach is a tort. The law allows nominal damages for breach of contract, without proof of actual damage. In negligence actions, however, since the cause of action is based on the law of torts, the better view denies nominal damages when actual damages are not proved. Verdict in this case should be instructed for the defendant, Y.

I have taken care to put only cases in which the plaintiff fails to recover because of some fatal defect in the proof of his *prima facie* case. There is some lack of one of the "four D's," and if any one is missing, the plaintiff has fallen short and cannot recover. On these the plaintiff has the "burden of proof." The burden of pleading follows the burden of proof; so it is evident that in his petition or declaration, wherein he pleads the "essential facts" of his grievance, the plaintiff must necessarily plead the "four D's." Pleadings are required for the purpose of giving the opposing party notice of one's contentions and fair opportunity to prepare his reply and countering evidence. It is therefore a cardinal rule that a plaintiff cannot prove what he does not plead. Thus, even if a plaintiff has evidence available to prove the "four D's" but has omitted to plead one of them, there is a fatal variance between proof and pleadings.

On proper objection, the court will exclude the proffered testimony on the subjects not pleaded. In such case, plaintiff will prevail only in event he can secure leave to file a "trial amendment" conforming his pleadings to the proposed proof. Whether this will be allowed so late as trial lies strictly within the sound discretion of the trial court. Thus, occasions may arise when the defendant will prevail either because: (1) the plaintiff has evidence available to prove the "four D's" but has failed to plead one or more of them in advance of trial and is impaled on the rule that one cannot prove what he has not pleaded; (2) the plaintiff has adequate pleadings but fails to offer evidence in proof of each of the "four D's," or (3) the plaintiff has adequate pleadings and offers evidence on each of the "four D's," but on one or more it is insufficient to raise an issue of fact for submission to the jury. In each of these cases, by filing a motion for an instructed verdict at the close of the evidence the defendant may win the case in the trial court through failure of the plaintiff to make out his *prima facie* case.

It is hoped that the foregoing analysis is not obscure or overtechnical. It is only in accepting the challenge of the law in action that one can grasp the true nature of the judicial process.

(To be continued)

## GLANDULAR PHYSIOLOGY AND THERAPY

### THE ADRENOGENITAL SYNDROME

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NEW YORK

*This special article is published under the auspices of the Council on Pharmacy and Chemistry. It is one of a series which will be published in book form as the second edition of "Glandular Physiology and Therapy." The opinions expressed in this article are those of the author and do not necessarily represent the views of the Council.—ED.*

The advances made in adrenal and sex endocrinology during the past decade have materially broadened and to some extent rationalized our conceptions about the essential nature of the adrenogenital syndrome. In keeping with the general intent of this series, the endocrinologic and biochemical aspects have been preferentially treated in this article, at the expense of the clinical and pathologic features. A brief description of the latter aspects will suffice as a background for the topics more specifically discussed here.<sup>1</sup>

The adrenogenital syndrome in the broadest sense of the term comprises all conditions in which the abnormal changes in the sexual sphere are referable to organic or functional disturbances in the adrenal cortex. It is far more frequently seen in females, in whom the changes consist in the appearance of the male secondary sex characteristics and the repression of female characters and function: adrenal virilism. In general, the earlier in life the lesion develops, the more pronounced is the masculinization; hence in very young children, in whom the damage is probably prenatal, the picture is that of pseudohermaphroditism of various degrees, so that there is often some doubt about the true sex. If the onset occurs later in prepubertal life, the masculinization is usually less complete, and may overlap with signs of isosexual precocious maturity (enlargement of clitoris and labia majora, appearance of pubic hair and hirsutism, and sometimes also growth of breasts and appearance of menstruation). It is only natural that in many cases in which the imbalance is of a more latent character the onset of puberty is required to bring the maleness in appearance (contour of body, distribution of hair, failure of breasts to develop) into full prominence. Menstruation remains in abeyance. If the syndrome becomes established after normal puberty, or later in life, hirsutism is usually the first change noted, followed by irregularity or cessation of the menstrual cycle, changes in the body contour and usually mammary atrophy and enlargement of the clitoris.

In males the juvenile form of the syndrome gives rise to precocious sexual maturity with genital enlargement and hirsutism, often associated with rapid increase in stature and muscular development, or with obesity. In adult men the disease is rare, and then the tendency is more frequently toward feminization, with enlargement of the breasts and genital atrophy, than toward increased virility.

1. Recent books and reviews that may be consulted in this connection are: (a) Grollman, Arthur. *The Adrenals*. Baltimore, Williams & Wilkins Company, 1936. (b) Young, H. H.: *Genital Abnormalities, Hermaphroditism and Related Adrenal Diseases*. Baltimore, Williams & Wilkins Company, 1937. (c) Broster, L. R.; Allen, C.; Vines, H. W. C.; Patterson, J.; Greenwood, A. W.; Marrian, G. F., and Butler, G. C.: *The Adrenal Cortex and Intersexuality*. London, Chapman and Hall, 1938. (d) Haymaker, Webb, and Anderson, Evelyn: *The Syndromes Arising from Hyperfunction of the Adrenal Cortex: The Adrenogenital and Cushing's Syndromes—A Review*. *Internat. Clin.* 4: 245 (Dec.) 1938. (e) Cahill, G. F.: *The Adrenogenital Syndrome and Adrenocortical Tumors*. *New England J. Med.* 218: 803 (May 12) 1938.

8. Contrast this with the English rule. A negligently operated tramcar collided with a hearse carrying a coffin containing a corpse on its way to the cemetery. The hearse was damaged and there was imminent danger that the coffin would be thrown on the pavement. The spectacle caused nervous "shock" to four relatives of the decedent who were following behind in the funeral cortege. The trial court denied recovery, but the Court of King's Bench held that plaintiffs could recover damages. "Nervous shock, if caused by the defendants' negligent act, is just as really damage to the sufferer as a broken limb." (*Owens v. Liverpool Corporation* [108 L. J. K. B. 155, 1939, 1 K. B. 394]).

Besides the changes in the sexual sphere and the acne of the face, back and chest, which is almost invariably present, other less constant features occur with various degrees of frequency. Such are obesity or abnormal distribution of fat, purple striae, hypertension, osteoporosis and frank or latent diabetes. All the latter conditions are also encountered in Cushing's syndrome (basophil adenoma of the pituitary). The original definition of this syndrome lists among its symptoms genital dystrophy and depression of sexual functions but not signs of sex reversal, such as virilism; later, however, it became increasingly clear that no sharp line of demarcation could be drawn between this condition and the adrenogenital syndrome proper. The frequent findings of malignant adrenocortical tumors in cases of either condition add to the difficulty of classification. There has been an increasing tendency in recent years to ascribe the symptoms of Cushing's disease to a primary hyperfunction of the adrenal cortex, while others adhere to the original view, which holds that the fundamental endocrine disturbance is in the pituitary. Whatever interpretation may be correct, there is hardly any doubt that the adrenal cortex is somehow involved in most, if not all, cases of this syndrome. This is probably true also of the "diabetes of bearded women," first described by Achard and Thiers, in which the chief symptoms are hirsutism of the face, irregularity or absence of menstruation, obesity and glycosuria. Since other features of Cushing's disease are frequently present, the condition is now usually regarded as a variation of the latter syndrome.

The condition of the adrenal cortex in the adrenogenital syndrome bears no definite relation to the type and severity of the symptoms. The gland may be grossly normal, slightly or considerably hyperplastic or, more rarely, may be adenomatous or carcinomatous. The reported absence of structural abnormalities, as well as the fact that adrenal hyperplasia is a relatively common finding entirely apart from the syndrome, makes it necessary to assume that the disturbance in these cases arises on a functional rather than on a structural basis. The often confirmed remission of the symptoms after unilateral adrenalectomy when the removed gland was normal in size or only slightly enlarged seems to justify this view. Neither do all neoplasms of the cortex give rise to sexual changes. Among the symptom-producing tumors, malignant carcinoma predominates. This type of tumor is found in cases of juvenile and adult virilism, of isosexual precocity in boys and girls, of feminization in adult males and of Cushing's syndrome. It is clear from this that cortical neoplasms may cause changes in the direction of masculinity as well as of femininity, which has led to the distinction, on purely clinical grounds, between androgenic and estrogenic tumors.

Grollman,<sup>1a</sup> who has denied the existence of estrogenic tumors, postulated that all masculinizing tumors arise from a special "androgenic" tissue, which is functionally distinct from the rest of the cortex. In fetal and early postnatal life this tissue comprises a part of the reticular zone; later it undergoes involution and then is confined to a thin juxtamedullary layer or merely a few scattered cells in this location. More recently, however, the author seems to have discarded this hypothesis (Gersh and Grollman<sup>2</sup>) and now attributes virilism either to the inclusion on the cortex of testicular rests which become functional or to a

derangement in steroid metabolism resulting in the formation of androgens. Vines and co-workers<sup>1c</sup> have attempted to correlate virilism with the presence of histologic elements showing an abnormal (red) staining reaction with the ponceau fuchsin stain. The fuchsinophil material is not confined to any particular cell type, nor to the juxtamedullary zone, and therefore does not seem to bear any relationship to Grollman's androgenic tissue. In the series of Broster and Vines the reaction was positive in normal-sized and hyperplastic adrenals in 34 of 36 cases of virilism. Among the tumors, only those causing masculinizing symptoms gave the reaction. These observations have been confirmed by others, though Cahill<sup>3</sup> could find an excess of fuchsinophil material only in carcinoma, and not in adenomatous or non-neoplastic glands.

#### ENDOCRINE BASIS OF THE ADRENOGENITAL SYNDROME

An interesting theory concerning the influence of the adrenal cortex on sexuality has been developed by Vines and co-workers,<sup>1c</sup> based chiefly on a study of the fuchsinophil reaction in human fetal adrenals, which cannot be rendered here in detail. In brief, the cortex is conceived as "a potentially bisexual accessory sex gland, largely controlled by the pituitary and capable of secreting simultaneously androgens or estrogens, the one or the other being in excess." In the fetal adrenals of both sexes there occurs an androgenic phase shortly after the differentiation of the gonads and accessory sex organs has been completed. In the female this phase is of much shorter duration than in the male, but it nevertheless "interrupts the continuity of development along female lines and thereby introduces an element of instability," while in the male it serves to reinforce and stabilize the genetic maleness. In the female an overproduction of adrenal androgen during the androgenic phase or a failure of the latter to be terminated by inhibitory influences normally present (pituitary?) may then lead to various degrees of fetal masculinization. If the androgenic factor becomes dominant early in fetal life (before the twentieth week), the female gonad itself, which is then still in a plastic state, may become inverted (pseudohermaphroditism). Adolescent virilism is conceived as resulting from later fetal masculinization, which does not affect the gonad, and remains latent till puberty. Other forms of the syndrome are simply referable to an overproduction of adrenal androgenic or estrogenic factors, with the primary stimulus either residing in the gland itself (tumors) or in the pituitary (Cushing's syndrome).

The fundamental premise of this hypothesis, namely, that the adrenal can elaborate androgens and estrogens, is now well established by chemical research. There is also some reason to believe that this secretion is subject to, if not necessarily regulated by, stimuli from the pituitary. The exact mechanism involved in the pathologic overproduction of these hormones can only be guessed. The existence in the cortex of a special tissue secreting sex hormones which is stimulated to overfunction in disease must be regarded as highly hypothetical. The substances responsible for the symptoms may be formed by some aberration of cortical steroid metabolism; or, since there is evidence that the gland normally gives rise to androgens and perhaps estrogens, the pathologic change may consist merely in an increased rate of production. There are indications that the metabolism of cortical steroids, other

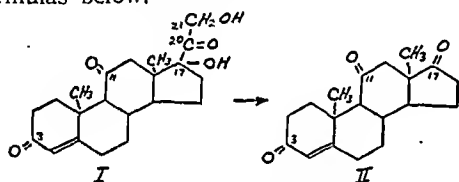
2. Gersh, I., and Grollman, Arthur: The Relation of the Adrenal Cortex to the Male Reproductive System, *Am. J. Physiol.* **126**: 568 (June) 1939.

3. Cahill, G. F.: Adrenal Cortical Syndromes and Adrenal Tumors, *Tr. Am. A. Genito-Urin. Surgeons* **31**: 111, 1938.

than androgens, is affected in virilism. Indeed, Haymaker and Anderson<sup>1d</sup> expressed the opinion that Cushing's syndrome differs from the adrenogenital syndrome proper mainly in that overproduction of the cortical hormones acting on electrolyte and carbohydrate metabolism supervenes in the former and that of sex hormones in the latter. In support of this view they quoted their own findings on the presence of a life-maintaining factor in the blood and urine of patients with Cushing's disease,<sup>4</sup> on serum electrolyte changes in this disease which are opposite to those observed in adrenal cortex insufficiency,<sup>5</sup> and on the diabetes often associated with the syndrome.

#### ANDROGENS IN THE ADRENAL CORTEX

In 1936 Reichstein<sup>6</sup> isolated from beef adrenals an unsaturated triketone, adrenosterone (II), which exhibited androgenic potency in the capon comb test equivalent to one fifth of that of androsterone. More recently a saturated compound, structurally related to adrenosterone, 11-hydroxyisoandrosterone (formula II minus double bond, hydroxyl groups instead of keto groups at C<sub>3</sub> and C<sub>11</sub>), was also found in the gland.<sup>7</sup> Its androgenic potency is only one thirtieth of that of androsterone.<sup>8</sup> Both these compounds have also been prepared in the laboratory by oxidative degradation of certain pregnane derivatives occurring in the adrenal cortex. The formation of adrenosterone from 11-dehydro-17-hydroxycorticosterone (I), a compound possessing weak life maintenance activity, is shown in the formulas below.



The cleavage of the side chain can also be effected, as Mason<sup>9</sup> has shown, by weak alkali. It is conceivable that similar reactions resulting in the production of androgenic ketones may also occur biologically and that this represents the pathway by which the cortical steroids possessing the requisite groups at C<sub>17</sub> and C<sub>20</sub> are degraded in the organism. Pregnane compounds of this type, which thus, from the chemical point of view, may be considered as potential precursors of androgens, are relatively abundant among the steroids of the adrenal cortex. It is interesting in this connection that one of these compounds, the 17-hydroxyprogesterone recently isolated by Pfaffner and North,<sup>10</sup> is by itself androgenic, its potency in the rat test equaling that of androsterone. On oxidation it yields  $\Delta_4$ -androstenedione, which, a close relative of testosterone, is still more effective in the castrated rat. This suggests that 17-hydroxyprogesterone may owe its androgenic properties to degradation in the treated ani-

mal to androstenedione, although it is of course equally possible that the original molecule may be androgenic as such.

#### EXCRETION OF SEX HORMONES AND RELATED STEROIDS IN THE ADRENOGENITAL SYNDROME

**Androgens.**—Owing to the expense and difficulty of the capon comb growth method of assaying urine for androgens, quantitative data on the excretion of these substances are yet too scant to permit satisfactory correlation with the clinical and pathologic observations. The colorimetric method when used, as by Callow,<sup>11</sup> with proper caution regarding procedure and interpretation may prove of great value in this respect. There is, however, some agreement on the point that malignant cortical tumors are often associated with inordinately high levels of androgen excretion regardless of the sex of the patient and the type of the symptoms. Of particular interest in this connection is a report by Crooke and Callow<sup>12</sup> on 2 cases of adrenal carcinoma classed as pituitary basophilism (the patients were a 25 year old man and a 6 year old girl); the authors contrasted the relatively enormous amounts of androgen excreted in these cases with the essentially normal amounts in 2 other cases of the syndrome not associated with adrenal tumor. But exceptions undoubtedly occur, as in a case of carcinoma listed by Kenyon and co-workers<sup>13</sup> in which the figure was not far above the normal range. Moderately elevated or essentially normal values of urinary androgen seem to prevail in cases of adolescent or adult virilism in which there is no evidence of a malignant tumor.<sup>14</sup> In the series of Broster, in which information about the condition of the gland was available through unilateral adrenalectomy, Patterson and Greenwood<sup>15</sup> determined the so-called "free male hormone" (the androgenic substance extractable without previous acid hydrolysis of the urine), because this entity was found to be entirely absent from normal female urine. There was no particular correlation between the amounts of free androgen excreted and the size of the gland or the degree of virilism; however, in almost all cases in which free androgen was present, the gland showed a strong fuchsinophil reaction. The operation effected an immediate reduction of the free androgen in the urine and the virtual disappearance of this substance in later postoperative stages. Similarly, the excessive (total) androgen observed in cases of tumor of the adrenal was seen to decline to lower values after operation.<sup>12</sup>

The androgen content of hyperplastic glands seems to be so low that in most cases it is not demonstrable at all (Patterson and Greenwood<sup>15</sup>). Slot<sup>15</sup> found none, and Crooke and Callow<sup>12</sup> only comparatively small quantities of androgen (0.2 to 0.35 international unit per gram of non-necrotic tissue) in tumors which had given rise to excessive amounts in the urine.

4. Anderson, Evelyn, and Haymaker, Webb: Adrenal Cortical Hormone in Blood and Urine of Patients with Cushing's Disease, *Proc. Soc. Exper. Biol. & Med.* **38**:610 (June) 1938.

5. Anderson, Evelyn; Haymaker, Webb, and Joseph, Michael: Hormone and Electrolyte Studies of Patients with Hyperadreno-Cortical Syndrome (Cushing's Syndrome), *Endocrinology* **23**:398 (Oct.) 1938.

6. Reichstein, T.: "Adrenosterone." Ueber die Bestandteile der Nebennierenrinde II, *Helvet. chim. acta* **19**:223, 1936.

7. Reichstein, T., and von Ew, J.: Ueber Bestandteile der Nebennierenrinde: XX. Isolierung der Substanzen O (Desoxyocorticosteron) und R sowie weiterer Stoffe, *Helvet. chim. acta* **21**:1197, 1938.

8. Reichstein, T.: Ueber Bestandteile der Nebennierenrinde: IV, *Helvet. chim. acta* **19**:402, 1936.

9. Mason, H. L.: Chemical Studies of the Suprarenal Cortex: V. Conversion of Compound E to the Series Which Contains Four Atoms of Oxygen and to Adrenosterone by the Action of Calcium Hydroxide, *J. Biol. Chem.* **124**:475 (July) 1938.

10. Pfaffner, J. J., and North, H. B.: 17- $\beta$ -Hydroxyprogesterone, *J. Biol. Chem.* **132**:459 (Feb.) 1940.

11. Callow, N. H.; Callow, R. K., and Emmens, C. W.: Colorimetric Determination of Substances Containing the Grouping  $\cdot\text{CH}_2\cdot\text{CO}\cdot$  in Urine Extracts as an Indication of Androgen Content, *Biochem. J.* **32**:1312 (Aug.) 1938.

12. Crooke, A. C., and Callow, R. K.: The Differential Diagnosis of Forms of Basophilism (Cushing's Syndrome) Particularly by the Estimation of Urinary Androgen, *Quart. J. Med.* **8**:233 (July) 1939.

13. Kenyon, A. T.; Gallagher, T. F.; Peterson, D. H.; Dorfman, R. L., and Koeh, F. C.: The Urinary Excretion of Androgenic and Estrogenic Substances in Certain Endocrine States: Studies in Hypogonadism, Gynecomastia and Virilism, *J. Clin. Investigation* **16**:705 (Sept.) 1937.

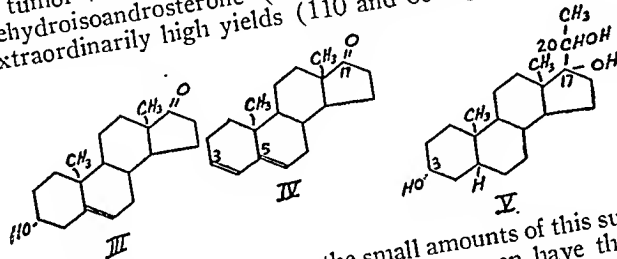
14. (a) Levy Simpson, S.; de Fremery, P., and Macbeth, Alton: The Presence of an Excess of Male (Comb Growth and Prostate Stimulating) Hormone in Virilism and Pseudohermaphroditism, *Endocrinology* **20**:363 (May) 1936. (b) Glass, S. J., and Bergman, H. C.: Subclinical Adrenogenital Syndrome, *ibid.* **23**:625 (Nov.) 1938. (c) Callow, R. K.: The Significance of the Excretion of Sex Hormones in the Urine, *Proc. Roy. Soc. Med.* **31**:841 (May) 1938. (d) Kenyon and others.<sup>13</sup>

15. Slot, W. J. B.: The Relation of Sex Hormones in a Case of Virilism by Hypernephroma, *Acta med. Scandinav.* **89**:371, 1936.

Obviously, only an insignificant portion of the androgen produced is stored at the site of origin. This is reminiscent of the situation in normally functioning endocrine glands which produce steroid hormones (testis, ovarian follicle, corpus luteum).

**Estrogens.**—Abnormally high amounts of estrogen seem to be excreted sometimes in virilism with or without adrenal neoplasm<sup>16</sup> but more often in those cases of adrenal tumor classed as instances of Cushing's syndrome.<sup>17</sup> Frank<sup>17a,b</sup> considered inordinately high amounts (1,000 to 10,000 mouse units per day) as characteristic for cortical carcinoma, since he did not observe them in cases in which the gland was merely adenomatous or hyperplastic (Frank test). It has to be pointed out, however, that by no means all cases of carcinoma exhibited this feature,<sup>18</sup> so that only a strongly positive test may be regarded as diagnostically significant.

**Excretion Products.**—The excessive androgen titer of the urine examined chemically by Callow<sup>19</sup> in 2 cases of tumor was shown to be chiefly due to its content of dehydroisoandrosterone (III), which was isolated in extraordinarily high yields (110 and 60 mg. per liter).



This author suggested that the small amounts of this substance excreted by normal men and women have their source likewise in the adrenal. A related compound,  $\Delta_{3,5}$ -androstadiene-17-one (IV), accounted roughly for the moderately increased urinary androgen in a case reported by Burrows and co-workers.<sup>20</sup> The patient was a man exhibiting symptoms of feminization, caused by a metastasized adrenal tumor. Since the compound was not found in the urine of patients with cancer in other locations, its derivation from the adrenal and not from the testes, which were atrophied, is fairly certain. The estrogen excretion in this case was very high (3,000 international units per liter). The compound concerned was in all probability estrone (theelin). The relative preponderance of sex inversion is of interest. From the studies of Butler and Marrian<sup>21</sup> it appears that the excretion of steroids in the syndrome is

qualitatively as well as quantitatively altered from the normal. From the urine of patients with symptoms of virilism, caused by cortical hyperplasia, four steroids were isolated. One of these is a pregnane-3,17,20-triol (V) stereoisomeric with similar triols which occur in the gland itself (Reichstein). The authors definitely established the absence of this triol from the urine of normal men, and of normal and pregnant women; they also showed that it disappeared from the urine of the patients after removal of the hyperplastic gland. It is therefore an abnormal excretion product specifically associated with the syndrome and probably derived from the diseased gland. Later another triol of this type, stereoisomeric with the first, was isolated from the pathologic urines; furthermore, two stereoisomers of androsterone, isoandrosterone and 3 $\alpha$ -hydroxyetiocholan-17-one, were present. It should be mentioned that among the four isolated compounds only isoandrosterone is known to be (weakly) androgenic; 3 $\alpha$ -hydroxyetiocholanone, which was later shown to occur also in normal urine,<sup>22</sup> is physiologically inactive; and the two pregnanetriols should lack androgenic action for structural and stereochemical reasons.<sup>23</sup>

It was also noted by Butler and Marrian<sup>21a</sup> and by Venning, Weil and Browne<sup>24</sup> that their patients with virilism excreted pregnanediol. These patients had primary or secondary amenorrhea; the diol could therefore not have been derived, as in normal cyclic women, from the progesterone secreted by a functional corpus luteum. Since the adrenal cortex is known to elaborate progesterone,<sup>25</sup> and since the excretion of pregnanediol ceased after operation,<sup>24</sup> there can be little doubt as to the adrenal origin of the compound in these cases.

#### ADRENAL CORTEX AS A NORMAL SOURCE OF SEX HORMONES

It can now be considered as certain that at least a part of the androgens excreted by normal subjects is derived from an extragonadal source, which as far as present knowledge goes can be only the adrenal cortex. The urine of eunuchs and of ovariectomized women shows small but definite amounts of androgenic activity.<sup>26</sup> According to Callow,<sup>14c</sup> the figures may even overlap the normal range. Hirschmann<sup>27</sup> succeeded in identifying, by actual isolation, the androgens excreted by ovariectomized women as androsterone and dehydroisoandrosterone. The stereoisomer of the former, 3 $\alpha$ -hydroxyetiocholan-17-one, which is physiologically inactive, was likewise present. The yields were only little lower than those reported by the Callows when they isolated the same three compounds from the urine of normal women<sup>22a</sup> and men.<sup>22b</sup> It would seem from

16. (a) Saphir, William, and Parker, M. L.: Adrenal Virilism, J. A. M. A. 107:1286 (Oct. 17) 1936. (b) McGavack, T. H.: Masculinizing and Non-Masculinizing Carcinomata of Cortex of Adrenal, Endocrinology 26:396 (March) 1940. (c) Levy Simpson and others.<sup>14a</sup>

17. Frank, R. T.: (a) A Suggested Test for Functional Cortical Adrenal Tumor, Proc. Soc. Exper. Biol. & Med. 31:1204 (June) 1934; 32:396 (March) 1940. (b) A Suggested Test for Functional Cortical Adrenal Tumor, Proc. Soc. Exper. Biol. & Med. 31:1204 (June) 1934; 32:396 (March) 1940. (c) Graef, Irving; Bunim, J. J., and Rottino, Antonio: Hirsutism, Hypertension and Obesity Associated with Carcinoma of the Adrenal Cortex, Arch. Int. Med. 57:1085 (June) 1936. (d) Hare, D. C.; Ross, J. M., and Crooke, A. C.: Cortical Carcinoma of the Suprarenal, Lancet 2:118 (July 20) 1935. McGavack, T. H.: 18. Cahill, G. F.; Loeb, R. F.; Kurzrok, Raphael; Stout, A. P., and Smith, F. M.: Adrenal Cortical Tumors, Surg., Gynec. & Obst. 62:287 (Feb., no. 2A) 1936. Walters, W. L., and Kepler, E. J.: Adrenal Cortical Tumors and Their Treatment, Ann. Surg. 107:881 (June) 1938. Crooke and Callow.<sup>12</sup> Kenyon and others.<sup>13</sup> Slot.<sup>15</sup> Hare and others.<sup>14a</sup>

19. Crooke and Callow.<sup>12</sup> Callow.<sup>14c</sup>

20. Burrows, H.; Cook, J. W.; Roe, E. M. F., and Warren, F. L.: Isolation of  $\Delta_{3,5}$ -Androstadiene-17-one from the Urine of a Man with a Malignant Tumor of the Adrenal Cortex, Biochem. J. 31:930 (June) 1937.

21. Butler, G. C., and Marrian, G. F.: The Isolation of Pregnane-3,17,20-triol from the Urine of Women Showing the Adrenogenital Syndrome, J. Biol. Chem. 119:565 (July) 1937; The Isolation of 3 $\alpha$ -Hydroxyetiocholan-17-one, 3 $\beta$ -Hydroxyetiocholan-17-one (Isoandrosterone), and a New Triol from the Urine of a Woman with an Adrenal Tumor, ibid. 124:237 (June) 1938. "Hyperplasia" should be substituted for "tumor" in foregoing title; see correction in Nature, London, 142:400 (Aug. 27) 1938.

22. (a) Callow, Nancy H., and Callow, R. K.: The Isolation of 17-Ketosteroids from the Urine of Normal Women, Biochem. J. 33:931 (June) 1939. (b) Callow, Nancy H.: The Isolation of Two Transformation Products of Testosterone from Urine, ibid. 33:559 (April) 1939.

23. Recently Wolfe, Fieser and Friedgood published a careful quantitative study on the composition of the 17-keto steroid fraction from the urine of a girl with a corticoadrenal tumor. Androsterone was present in about the same amounts as in normal female urine (0.3 mg. per liter), while the levels of 3 $\alpha$ -hydroxyetiocholan-17-one (13 mg. per liter) and dehydroisoandrosterone (68 mg. per liter) represented tenfold and hundredfold increases, respectively, above normal. Furthermore,  $\Delta_{3,5}$ -androstadiene-17-one (25 mg. per liter) and 3 $\alpha$ -hydroxyandrostene-17-one, a new isomer of dehydroisoandrosterone in which the position of the double bond is still undetermined, were isolated. (Wolfe, J. K.; Fieser, L. F., and Friedgood, H. B.: Nature of the Androgens in Female Adrenal Tumor Urine, J. Am. Chem. Soc. 63:582 [Feb.] 1941.)

24. Venning, Eleanor H.; Weil, P. G., and Browne, J. S. L.: Excretion of Sodium Pregnanediol Glucuronide in the Adrenogenital Syndrome, J. Biol. Chem. 128:cvi (June) 1939.

25. Beall, D.: The Isolation of Progesterone and 3,20-Allopregnanolone from Ovarian Adrenals, Biochem. J. 32:1957 (Nov.) 1938.

26. Literature in Parker, A. S.: Source of Androgenic and Oestrogenic Substances in the Urine, Lancet 2:902 (Oct. 16) 1937.

27. Hirschmann, H.: Androgens from the Urine of Ovariectomized Women, J. Biol. Chem. 130:421 (Sept.) 1939; 136:483 (Nov.) 1940.

these results that the contribution of the adrenal to the normal excretion of androgen is much greater than was hitherto suspected.<sup>27a</sup>

The presence of residual estrogenic activity in the urine of male and female castrates<sup>26</sup> invites an analogous interpretation. The possibility that these small quantities may be derived from foodstuffs appears to have been ruled out by Eng.<sup>28</sup> The ability of the adrenal cortex to elaborate, if not to secrete, estrogens cannot be doubted, since crystalline estrone (theelin) has been isolated from beef glands.<sup>29</sup>

The still controversial question whether the adrenal cortex, with its potential faculty to secrete androgens and estrogens, actually plays a part, beside the gonads, in the regulation of normal sex functions must be treated here summarily. Gersh and Grollman<sup>2</sup> denied any normal "androgenic function" on the ground that the effect of castration on the accessory sex organs of male rats and mice is not modified by the absence of the adrenal, but this has been disputed by Burrill and Greene,<sup>30</sup> who contend that the partial maintenance, in early prepubertal life, of the ventral prostate of the young castrated rat is due to an androgenic secretion from the adrenals. A positive response of the accessory organs was also observed by Hodler<sup>31</sup> in castrated male guinea pigs receiving beef adrenal implants or extracts. Furthermore, Davidson and Moon<sup>32</sup> were able to produce significant enlargement of the seminal vesicles and prostates of castrated rats by means of adrenotropic anterior pituitary preparation, which also caused hypertrophy of the adrenal cortices. Since the effect could not be elicited in the absence of the adrenals, it is clear that this gland had been stimulated to secrete an androgenic principle. Similar results have been obtained by Hodler<sup>31</sup> in male guinea pigs, while in normal and ovariectomized females a masculinizing effect (hypertrophy of the clitoris) was observed. That a secretion of estrogens may be evoked by the same stimulus would appear from the experiments of Moon,<sup>33</sup> who induced vaginal opening and signs of estrus in immature spayed rats by administration of an adrenotropic extract.

It must be conceded that all these results, except perhaps those of Burrill and Greene, reveal a potential availability rather than an active, functional secretion of androgens and estrogens from the adrenal cortex. Further work is needed to clarify this issue. At any rate it would not seem, from the present evidence, that these secretions play an important part functionally in the normal adult organism. The biochemist is perhaps tempted to take the more limited view that they are incidental by-products of cortical steroid metabolism, which, to judge from the number of compounds isolated from the gland (most of which are physiologically inactive), seems to be highly complex and ramified.

27a. This is true also of the androgen excretion in males, since the Callows later demonstrated the presence of the aforementioned compounds in the urine of castrates. The level of dehydroisandrosterone equaled that of normal male urine, while the excretion of the other two steroids was lower than in normal males. The data gives support to Callow's earlier suggestion that dehydroisandrosterone, at any rate, may be wholly derived from the adrenals. (Callow, H. N., and Callow, R. K.: *Biochem. J.* 34: 276 (March) 1940.)

28. Eng, H.: *Follikulin im kastrierten Organismus*, Klin. Wehnsehr. 15: 349 (March 7) 1936.

29. Beall, D.: Isolation of Oestrone from the Adrenal Glands, *Nature*, London 144: 76 (July 8) 1939; *J. Endocrinology* 2: 81 1940.

30. Burrill, M. W., and Greene, R. R.: Further Studies on the Andromimetic Function of the Immature Rat Adrenal, *Endocrinology* 26: 645 (April) 1940.

31. Hodler, D.: Surrennales et masculinisation, *Arch. d'anat., d'histol. et d'embryol.* 24: 1, 1937.

32. Davidson, C. S., and Moon, H. D.: Effect of Adrenocorticotrophic Extract on Accessory Reproductive Organs of Castrated Rats, *Proc. Soc. Exper. Biol. & Med.* 35: 281 (Nov.) 1936; Davidson, C. S.: *ibid.* 36: 703 (June) 1937.

33. Moon, H. D.: Effect of Adrenocorticotrophic Hormone on Sexual Development of Spayed Rats, *Proc. Soc. Exper. Biol. & Med.* 37: 36 (Oct.) 1937.

## Council on Pharmacy and Chemistry

### NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

OFFICE OF THE COUNCIL.

#### KINNEY'S YEAST EXTRACT CONTAINING VITAMIN B COMPLEX (See New and Nonofficial Remedies, 1940, p. 524).

The following dosage form has been accepted:

*Kinney's Yeast Extract (Vitamin B Complex) Tablets, 5 grains:* Each tablet contains not more than 50 international units of thiamine hydrochloride and not less than 25 Sherman-Bourquin units of riboflavin.

Manufactured by the Scientific Sugars Company, Columbus, Ind.

#### NICOTINIC ACID AMIDE (See New and Nonofficial Remedies, 1940, p. 526).

The following product has been accepted:

*Nicotinic Acid Amide-Upjohn.*—A brand of nicotinic acid amide-N. N. R.

Manufactured by the Upjohn Company, Kalamazoo, Mich. No U. S. patent or trademark.

*Tablets Nicotinic Acid Amide-Upjohn, 50 mg.*

#### SODIUM CITRATE 2½% W/V IN PHYSIOLOGICAL SOLUTION OF SODIUM CHLORIDE IN CENTRI-VAC CONTAINER-BAXTER.—A sterile 2.5 per cent solution of sodium citrate in physiological solution of sodium chloride contained under reduced pressure of approximately 8 cm. of mercury in a specially adapted bottle which can be equipped with a special valve to regulate the inflow of liquids.

*Actions and Uses.*—An anticoagulant in a special container for the separation of plasma from whole blood by centrifugation or sedimentation and for the indirect transfusion of citrated whole blood. After aspiration of blood from the donor's vein to the container, it is mixed with the citrate and the cells are allowed to separate for the preparation of plasma. The container is also suitable for the indirect transfusion of the citrated blood. The plasma is transferred to another container for dilution, storage and administration.

*Dosage.*—35 cc. of the solution is used for each 250 cc. of whole blood.

Manufactured by Baxter Laboratories, Inc., Glenview, Ill. (American Hospital Supply Corporation, Chicago, distributor.) Produced and distributed in eleven Western states by Don Baxter, Inc., Glendale, Calif. U. S. patent 2,108,583.

*Sodium Citrate 2½% W/V in Physiological Solution of Sodium Chloride in Centri-Vac Container-Baxter, 15 cc. in 300 cc. Bottle:* Contains 2.5 per cent sodium citrate in physiological solution of sodium chloride.

*Sodium Citrate 2½% W/V in Physiological Solution of Sodium Chloride in Centri-Vac Container-Baxter, 35 cc. in 300 cc. Bottle:* Contains 2.5 per cent sodium citrate in physiological solution of sodium chloride.

#### PHYSIOLOGICAL SOLUTION OF SODIUM CHLORIDE (See New and Nonofficial Remedies, 1940, p. 379).

The following product has been accepted:

#### PHYSIOLOGICAL SOLUTION OF SODIUM CHLORIDE IN PLASMA-VAC CONTAINER-BAXTER.—A sterile isotonic solution of sodium chloride contained under reduced pressure of approximately 12 cm. or 30 cm. of mercury in specially adapted bottles which can be equipped with a special valve to regulate the inflow of liquids.

*Actions and Uses.*—The solution is used as a diluent in a special container for the aspiration, storage and administration of blood plasma obtained by centrifugation or sedimentation of citrated whole blood.

*Dosage.*—Two hundred and fifty cc. of the solution is used to dilute 250 cc. of plasma.

Manufactured by Baxter Laboratories, Inc. (American Hospital Supply Corporation, Chicago, distributor.) Produced and distributed in eleven Western states by Don Baxter, Inc., Glendale, Calif. U. S. patent 2,108,553.

*Physiological Solution of Sodium Chloride-Baxter, 250 cc. in 500 cc. container.*

#### THIAMINE HYDROCHLORIDE (See New and Nonofficial Remedies, 1940, p. 528).

The following dosage forms have been accepted:

*Mead's Thiamine Hydrochloride Tablets, 0.75 mg.* Prepared by Mead Johnson and Co., Evansville, Ind.

*Mead's Thiamine Hydrochloride Tablets, 3 mg.* Prepared by Mead Johnson and Co., Evansville, Ind.



# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 14, 1941

## THE CLEVELAND SESSION

An inundation of physicians beyond the capacity of the available hotels in Cleveland marked the annual session of the American Medical Association for 1941. The attendance was 7,269, more than twelve hundred above the attendance in the same city in 1934. Even the use of a boat with a tremendous capacity moored on the lake front failed to satisfy the desire for accommodations. The problem of selecting a place for the annual session that is capable of providing sufficient hotel rooms to meet the desire of American physicians who attend the annual sessions of the American Medical Association is one which now taxes the resources of our great cities. There is obvious need in the United States for some of our largest metropolitan centers to provide auditoriums such as those available in Atlantic City, and there is also need for the smaller communities which have such large auditoriums to make available sufficient hotel space to accommodate the numbers who now attend many large conventions.

Conspicuous in the Cleveland session were the exhibits. The unanimous encomiums by physicians who spent many hours in attendance on both the scientific and the technical exhibits are proof of the tremendous value attached to these features. Invariably the doctors said that the scientific exhibits offered the greatest concentrated postgraduate education in medicine made available anywhere in this or any other country. The scope of the exhibits, the perfection of organization, the attractiveness of the displays and the earnestness of the physicians who demonstrated were, no doubt, largely responsible for the enthusiasm. Since the time when Drs. Frank Wynn and Frank Billings first gave their personal attention to this development there has been steady progress toward the practical perfection now achieved.

The scientific sessions merit particular mention. The new Section on Anesthesiology justified its existence with attendance varying between one hundred and fifty

and two hundred and with an excellent program. The general scientific meetings included the clinical session, which was received with approbation, a special session on infantile paralysis in which the National Foundation for Infantile Paralysis cooperated, and a meeting on medical preparedness in which all the official agencies of the government and other agencies were well represented. In many of the sections the traditional scientific contributions were varied by panel discussions, round tables and similar meetings, indicating that the Council on Scientific Assembly and the officers of the sections are alert to the adoption of new technics in medical teaching.

The problems which confronted the House of Delegates were largely military, social and economic, but there were also evidences of concern of the House with problems of scientific advancement. The medical profession is ready, through the work of the Committee on Medical Preparedness, to meet the needs of the government and of civilian agencies for medical service. Obviously, as the House recommended, some central assignment authority must be developed, having available a full knowledge of the medical resources of the country, to distribute medical personnel to meet all the various needs. Continuity of medical education is absolutely essential to maintenance of an adequate supply of physicians for all these purposes. Largely discussed also was the situation now created by the certifying boards in the specialties and by some of the activities of the Advisory Board created by these certifying boards. The resolutions on this subject and the discussion associated with their presentation and consideration indicated how essential is thorough consideration before taking further action in this field. Indeed, the Council on Medical Education and Hospitals of the Association was specifically requested by the House of Delegates to manifest leadership in aiding the work of these certifying boards so that they function primarily for the good of the people and for the advancement of medical science and avoid the tendency toward the establishment of guilds which in some instances seems to prevail. The various resolutions offered on this subject will be published as part of the proceedings of the annual session, which begin in this issue of THE JOURNAL.

Especially significant was the action taken by the House of Delegates to establish a Committee on Pan American Relationships, which is to be concerned with the establishment of scientific interchange with the medical societies of our South American, Mexican, Cuban, Puerto Rican and Canadian colleagues. The annual session for 1942, to be held in Atlantic City, has been announced as a Pan American session to which distinguished representatives of the other American nations

will be asked to send representatives, exhibits and, indeed, to participate as much as possible. The Council on Scientific Assembly is charged by the Association with the development of the scientific aspects of this session.

Noteworthy among the social functions of the 1941 session were the opening general meeting, which was held in the Music Hall under perfect conditions and which included addresses by distinguished clergymen, the governor of Ohio, the mayor of Cleveland and the officials of the Association, and the President's reception in the Hotel Cleveland, largely attended and with ideal arrangements for this delightful function, and the golf tournament, with the largest registration in its history. The dinners given to the Board of Trustees and the House of Delegates by the Ohio State Medical Association and the Cleveland Academy of Medicine were on a dignified plane, again perfectly arranged with the provision of delightful entertainment and exceptional cuisine.

The House of Delegates voted in executive session without a dissenting vote to carry onward the trial of the case of the United States government versus the American Medical Association et al., so that a decision may be had from the highest courts as to the place which organized scientific medicine is to occupy in our economy. The unity of the action taken, the careful consideration given to every problem presented, the insight into the affairs of medical practice in the United States testified to the extraordinarily high character of the representation in the House of Delegates, the body which is charged by the American Medical Association with the establishment of its policies.

The 1941 session witnessed the end of the term of service of Dr. Thomas Cullen as a member of the Board of Trustees, a service which he has rendered as a contribution to the advancement of medicine for the past twelve years. In his place comes Dr. Charles W. Roberts of Atlanta, Ga., for some time a member of the House of Delegates and of the Council on Industrial Health. The death of Dr. Fred Moore and the election of Dr. Fred Rankin to the presidency brought about two vacancies on the Council on Medical Education and Hospitals. For these positions the Board of Trustees nominated several distinguished physicians, from whom the House of Delegates elected Drs. Harvey B. Stone of Baltimore and Russell Haden of Cleveland. In the development of American medical practice this Council's part is now so vital that these additions to the membership are considered especially fortunate.

Thus passed the annual session of 1941—a credit to the Local Committee on Arrangements and to the city in which it was held; a credit to the official bodies of the Association who were charged with the creation of the exhibits and the handling of its affairs; a credit, indeed, to all who participated.

## PROFESSIONAL TESTIMONIALS [?]

The Bureau of Investigation of the American Medical Association has always contended that testimonials, whether of doctors or of laymen, are of little scientific value. Frequently a monetary exchange influences a testimonial, in its opinion.

An orthopedic surgeon in Chicago recently received a letter on the stationery of the Scholl Manufacturing Company of Chicago which reads:

"Dear Sir: It is our intention to make a clinical investigation of some of our foot preparations and we would like to know if you are willing to do this work for us.

"Due to your wide experience in this field, we would greatly appreciate getting affidavits from you and learning your fee for these medical reports.

"These affidavits should contain the extent of your investigations and a sanction in regard to our claims, as well as the effectiveness of these products.

"If you do decide to make this clinical investigation, will you please drop a note to Dr. Einstoss, so that an appointment can be arranged for a time that will be mutually agreeable."

Apparently the Scholl Manufacturing Company fails to recognize that statements obtained in this manner do not constitute acceptable scientific evidence on which to devise claims for products.

Perhaps there is no relationship between the request and the statement issued on Dec. 8, 1940 by the Federal Trade Commission:

"Scholl Manufacturing Company, Inc., 211 West Schiller St., Chicago, engaged in the manufacture and distribution of devices known as 'Dr. Scholl's Zino-Pads' and 'Dr. Scholl's Kurotex Foot Plasters,' designed for the treatment of corns, bunions and other foot ailments, has been ordered by the Federal Trade Commission to cease and desist from certain misrepresentations of the products.

"The respondent is ordered to cease and desist from disseminating or causing to be disseminated any advertisement in commerce which represents, directly or through inference, that the use of 'Dr. Scholl's Zino-Pads' stops pain instantly or in one minute; that corns or callouses can be lifted out after the application of 'Dr. Scholl's Zino-Pads' without the use of surgery or other aids; that the use of 'Dr. Scholl's Zino-Pads' is a cure or remedy for corns, callouses or bunions; that 'Dr. Scholl's Zino-Pads' have healing properties; or that the use of 'Kurotex Foot Plasters' instantly relieves the pain caused by corns, sore toes, callouses, bunions or tender spots on the feet caused by new or tight shoes, or gives any degree of relief from such condition in excess of that which follows from the protection from outside pressure and friction, or gives any relief from such conditions except during the time that the 'Kurotex Foot Plasters' are worn."

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## Current Comment

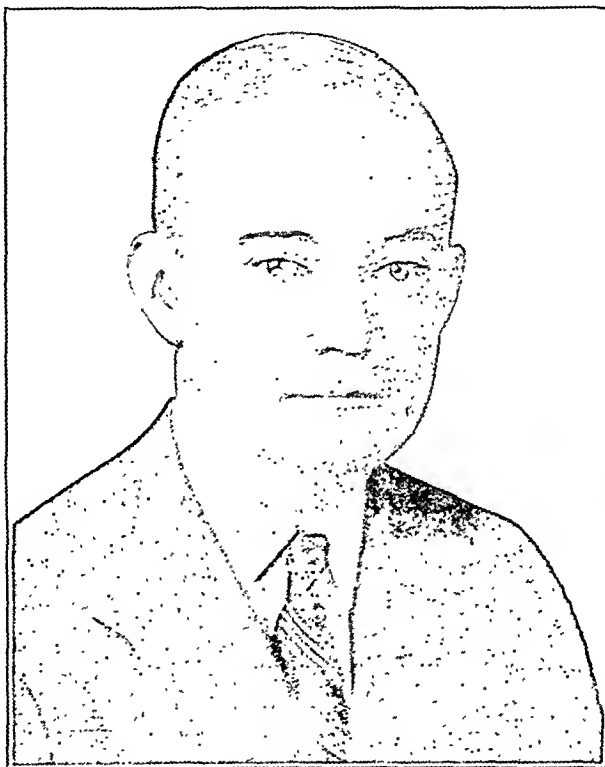
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### FOURTH OF JULY FIREWORKS INJURIES

This year, as in the previous four years, the American Medical Association is circularizing hospitals, dispensaries and other institutions in the United States with a view to compiling a record of the deaths and injuries resulting from celebration of the Fourth of July with fireworks. As the result in large part of these annual summaries, several states have adopted effective anti-fireworks legislation. The number of deaths from this cause has been reduced therefore in 1940 to 8 as compared with 20 in 1937. The total number of injuries has been reduced from 7,205 in 1937 to 4,462 in 1940. Although the improvement is considerable, it is still obvious that there can be no relaxation of effort in the attempt to prevent such unnecessary accidents. Hospitals throughout the country are again asked to cooperate in the careful filling out and prompt return of the questionnaires which they will shortly receive in order that a still further improvement in the situation may be brought about.

### FRED WHARTON RANKIN— PRESIDENT-ELECT

Again a surgeon of international repute has been elected by the House of Delegates of the American Medical Association to the highest honor in the province of scientific medicine. Again the House of Delegates recognized service to organized medicine: the physician selected is one who has participated notably in the affairs of the American Medical Association and of many other scientific bodies. Dr. Rankin was born in Mooresville, N. C., on Dec. 20, 1886. After receiving his bachelor of arts degree from Davidson College in 1905 he received his degree of doctor of medicine from the University of Maryland in 1909 and the degree of master of arts from St. John's College in 1913. He was also made honorary doctor of sciences by Davidson College, his alma mater, in 1937, and honorary LL.D. by the University of Maryland in 1939. Following his graduation in medicine he became a resident surgeon at the University Hospital in Baltimore from 1909 to 1912 and served as assistant demonstrator of anatomy and associate in surgery at the University of Maryland Medical School from 1913 to 1916. He then joined the Mayo Clinic in Rochester, Minn., acting as assistant surgeon at St. Mary's Hospital, 1916-1923. He was professor of surgery at the University of Louisville, 1922-1923, and served as surgeon to the Mayo Clinic and as associate professor at the University of Minnesota Medical School, Mayo Foundation, 1926-1933. He then removed to Lexington, Ky., where he became surgeon to St. Joseph's and the Good Samaritan hospitals, with which he has been associated since Jan. 1, 1934. In the World War Dr. Rankin served as a major in the Medical Corps for seventeen months and was attached to the First Army Corps, 4th and 26th divisions in France, as commanding officer of Base Hospital No. 26. He is now a colonel in the Medical Reserve Corps. He has been honored by many medical organizations, including the presidency of the Southern Surgical Association and the Southeastern Surgical Congress. He is a fellow of the American College of Surgeons and a member of the American Surgical Association, American Proctologic Society, Eastern and Western Surgical associations, Southern Medical Association and many surgical clubs and medical fraternities. He was one of the founder members of the American Board of Surgery, representing in that body



FRED W. RANKIN, M.D.  
PRESIDENT-ELECT OF THE AMERICAN MEDICAL ASSOCIATION

the Section on Surgery of the American Medical Association. His contributions to medical literature include a monograph on "Surgery of the Colon"; a work on "The Colon, Rectum and Anus," published in 1932 jointly with Drs. J. A. Bargen and L. A. Buie, and a work on "Cancer of the Colon and Rectum," published with Dr. A. S. Graham in 1939. He has also contributed chapters on surgery of the colon, with particular reference to carcinoma, in several systems of surgery. In the American Medical Association Dr. Rankin has been especially active. He was a member of the House of Delegates, representing the Section on Surgery from 1935 through 1940. On several occasions he has aided in the work of the reference committees.

In 1936 he was appointed to the membership of the Council on Medical Education and Hospitals, and he has been active in the work of that body. He was appointed by the speaker of the House of Delegates a member of the Committee on Medical Preparedness in 1940 and has been assiduous in the duties of that committee and especially in military preparedness in the Fifth Corps Area. In 1923 Dr. Fred W. Rankin married Miss Edith Mayo, a daughter of Dr. Charles H. Mayo, and he has four children: Frederic Wharton, Edith Graham, Charles Mayo and Thomas Alexander. Almost immediately following his election he was deluged with invitations to attend many meetings of state and other medical

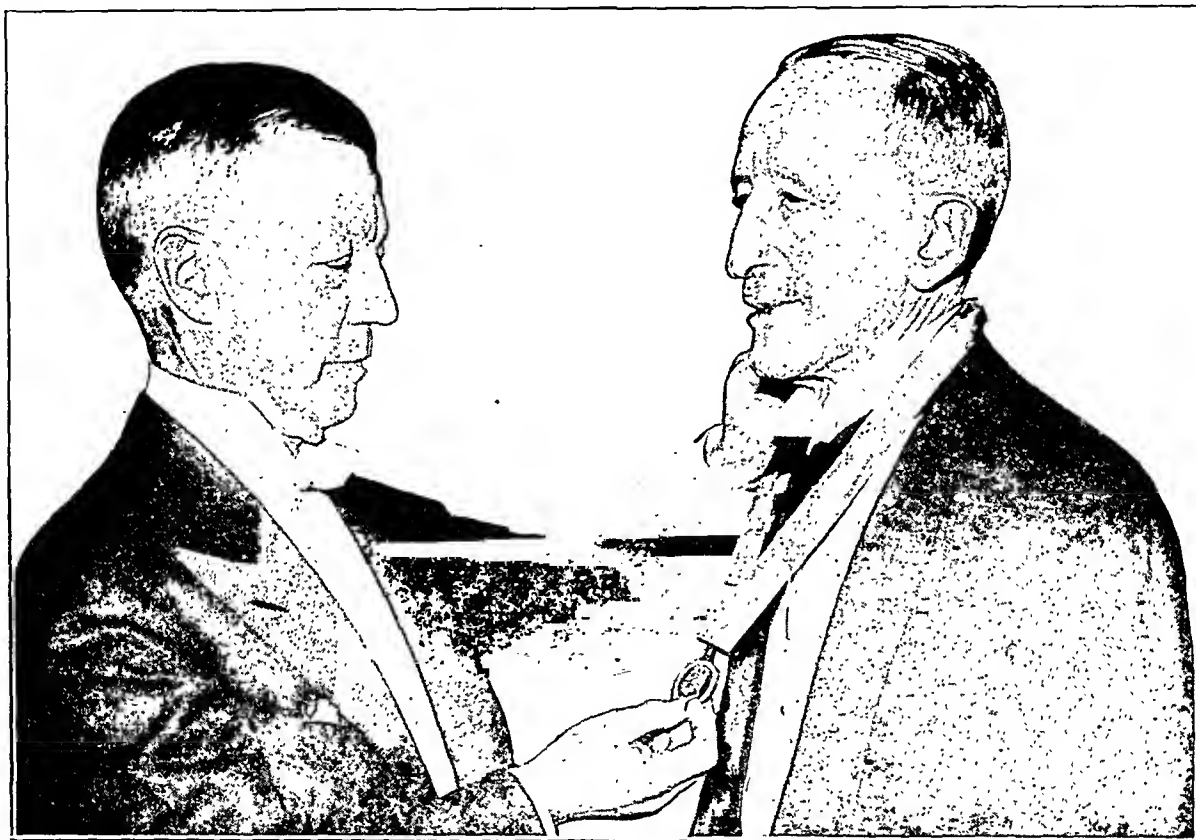
organizations, indicating not only his popularity with the medical profession but his devotion to the work of organized medicine.

### THE DISTINGUISHED SERVICE MEDAL

To the distinguished names of Rudolph Matas, surgeon, James B. Herrick, internist, and Chevalier Jackson, otolaryngologist, the House of Delegates added that of Dr. James Ewing of New York, world famed as a pathologist, as the recipient of the Distinguished Service Award of the American Medical Association for 1941. Although 74 years of age, Dr. Ewing came at once from New York to be present on the platform at the opening session to receive the Distinguished Service Medal in person. To repeat the record of his career is almost unnecessary, since he is widely known on several continents. Dr. James Ewing was born in Pittsburgh on Christmas day, 1866. He received his bachelor's degree from Amherst in 1888 and his master of arts degree in 1891. Following his funda-

mental education, he attended the College of Physicians and Surgeons of New York, now known as Columbia University College of Physicians and Surgeons, and received his degree of doctor of medicine in 1891. He has also been honored with honorary degrees of doctor of science by the University of Pittsburgh in 1911, by Amherst in 1923, by the University of Rochester in 1932 and by Union College in 1938 and with the LL.D. degree by Kenyon College in 1931 and by Western Reserve University in the same year. Early in his medical career Dr. James Ewing determined to devote himself to the fundamental sciences. He was a tutor in histology, 1893-1897, and had the Clark fellowship, 1896-1899. He then became instructor in

College, Dr. Ewing was honored with a dinner and with a testimonial volume including fifty-four articles on cancer written by authorities from all over the world. On that occasion messages were sent by President Hoover, Gov. Franklin Delano Roosevelt and Madame Curie, as well as many others. In 1936 he received the John Scott Award, consisting of a bronze medal and \$1,000, from the Philadelphia Board of City Trusts for his research in classifying tumors. He was appointed in 1937 a member of the National Advisory Cancer Council, and he has been a member of many other committees in this field. In 1940 he received the Clement Cleveland Medal of the New York City Cancer Committee. His literary contributions include



FRANK H. LAHEY, M.D., PRESIDENT OF THE AMERICAN MEDICAL ASSOCIATION, PRESENTING  
THE DISTINGUISHED SERVICE MEDAL TO JAMES EWING, M.D.

clinical pathology at the Columbia College of Physicians and Surgeons, 1897-1898; he was professor of pathology, from 1899-1932, at Cornell University Medical College and since 1932 has been professor of oncology. Indeed it is his fundamental work in the field of cancer that has made him most famous. Among other positions which he has occupied are the directorship of the Memorial Hospital in New York City. He is a member of such scientific organizations as the National Academy of Sciences, the Association of American Physicians, the American Roentgen Ray Society, the American Association of Pathologists and Bacteriologists, the Society of Experimental Biology and Medicine, the Harvey Society, the American Association for Cancer Research and the American Medical Museum Society. In 1931, when he was head of the department of pathology at Cornell University Medical

"Clinical Pathology of the Blood," published in 1900; his textbook on legal medicine published in 1910, and his work on "Neoplastic Diseases," first published in 1919. His writings include also innumerable contributions to systems of medicine and to scientific periodicals. As he received the medal from the hands of President Frank Lahey, Dr. Ewing paid a tribute to organized medicine, complimenting the American Medical Association on its devotion to scientific advancement and pointing out that during his fifty years of membership in the medical profession he had observed a continued advancement, so that American medicine occupies today a position of recognized leadership in the scientific medicine of the world. Dr. Ewing stated also that it was his belief that this position of leadership was a result of the inspiration and freedom of action associated with a truly democratic system of government.

# MEDICAL PREPAREDNESS

*In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.*

## ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

BARCOMB, Albert E., Lieut., M. R. C., Rochester, N. Y., Camp Forrest, Tenn.  
BURNES, Sidney H., 1st Lieut., West Hartford, Conn., Manchester, N. H.  
CARROLL, Francis B., 1st Lieut., Great Barrington, Mass., Fort Devens, Mass.  
CHESTER, Lewis, 1st Lieut., New Britain, Conn., Hartford, Conn.  
CROSKERY, William F., 1st Lieut., Milton, Mass., Hartford, Conn.  
CUTLER, Isadore L., 1st Lieut., Rutland, Mass., Fort Devens, Mass.  
DURHAM, Richard A., 1st Lieut., Ipswich, Mass., Fort Devens, Mass.  
DURLACHER, Stanley H., Lieut., M. R. C., New Haven, Conn., Camp Forrest, Tenn.  
DYE, William J. P., 1st Lieut., Wolfeboro, N. H., Manchester, N. H.  
EASTMAN, Oliver R., Lieut., M. R. C., Burlington, Vt., Camp Forrest, Tenn.  
FAGAN, Frederick J., 1st Lieut., Boston, Maxwell Field, Ala.  
FAILLA, Samuel D., 1st Lieut., Greenfield, Mass., Maxwell Field, Ala.  
FINEBERG, Meyer H., Major, Boston, Fort Devens, Mass.  
FISHBEIN, Jay N., 1st Lieut., Providence, R. I., Maxwell Field, Ala.  
FOSTER, Clarence B., 1st Lieut., Greensboro, Vt., Fort McClellan, Ala.  
GARIPAY, Stanley L., 1st Lieut., Hartford, Vt., Manchester, N. H.  
GELLER, Philip S., 1st Lieut., Newport, R. I., Hartford, Conn.  
GOODALL, Edwin B., Lieut., M. R. C., Newton Centre, Mass., Camp Forrest, Tenn.  
GURALNICK, Eugene A., Lieut., M. R. C., Roxbury, Mass., Camp Forrest, Tenn.  
HADLER, Arthur J., 1st Lieut., Boston, Camp Edwards, Mass.  
HAGOPIAN, Peter B., 1st Lieut., Danvers, Mass., Fort Devens, Mass.  
HAJJAR, Solomon G., 1st Lieut., North Billerica, Mass., Fort Devens, Mass.  
HANSELL, Howard R., 1st Lieut., Sharon, Conn., Fort Devens, Mass.  
HARRIS, Max, 1st Lieut., St. Albans, Vt., Fort Devens, Mass.  
HILL, Edwin V., 1st Lieut., Lexington, Mass., Fort Barrancas, Fla.  
HOLMES, Everett B., 1st Lieut., Ludlow, Vt., Fort Devens, Mass.  
HORTON, William H., 1st Lieut., Fall River, Mass., Hartford, Conn.  
JOSEPHS, William W., 1st Lieut., New Haven, Conn., Fort Devens, Mass.  
KANSKI, Francis A., 1st Lieut., Springfield, Mass., Camp Edwards, Mass.  
KEMBLE, Robert P., Captain, Worcester, Mass., Camp Edwards, Mass.  
KNOX, Barron D., Lieut., M. R. C., Holyoke, Mass., Camp Forrest, Tenn.

## SECOND CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Second Corps Area, which comprises the states of New York, New Jersey and Delaware:

ALFORD, Kenneth M., 1st Lieut., Buffalo, Fort Niagara, N. Y.  
AURINGER, Horace E., Major, Addison, N. Y., Fort Ontario, N. Y.  
BLEICH, Lamoyne C., 1st Lieut., Buffalo, Fort Bragg, N. C.  
BLOCK, Richard M., 1st Lieut., Kenmore, N. Y., Fort Bragg, N. C.  
BRIGGS, Bernard D., 1st Lieut., McGraw, N. Y., Fort Bragg, N. C.  
CARPENTER, Walter, 1st Lieut., New York, Fort Jay, N. Y.  
CHASSY, Gilbert H., 1st Lieut., Bronx, N. Y., Fort Jackson, S. C.  
CILIBERTI, Benjamin Joseph, 1st Lieut., Yonkers, N. Y., Fort DuPont, Del.  
CITRON, Adolph E., 1st Lieut., Baldwin, L. I., N. Y., Fort DuPont, Del.  
COLEMAN, Joseph A., 1st Lieut., New York, Fort Hancock, N. J.  
COLMER, Malcolm L., 1st Lieut., New York, Fort Dix, N. J.  
COPPOLA, Andrew R., 1st Lieut., Brooklyn, Fort Benning, Ga.  
CORBETT, Austin J., 1st Lieut., New York, Fort Benning, Ga.  
CORCORAN, William R., 1st Lieut., Binghamton, N. Y., Fort Jay, N. Y.  
COWEN, Louis, 1st Lieut., Brooklyn, Fort Hamilton, N. Y.  
CULVER, Wesley Y., 1st Lieut., Long Island, N. Y., Fort DuPont, Del.  
DAVERSA, Generoso, 1st Lieut., Brooklyn, Fort Jackson, S. C.  
DEABIO, Anthony J., 1st Lieut., Bronx, N. Y., Mitchell Field, N. Y.  
DOBKIN, Milton C., 1st Lieut., Ventnor, N. J., Fort Bragg, N. C.  
DOUCE, Joseph R., Captain, Buffalo, Fort Niagara, N. Y.  
D'ONOFRIO, Gregory, Captain, Brooklyn, Plattsburg Barracks, N. Y.  
DURANTE, Michael H., 1st Lieut., Rochester, N. Y., Fort Ontario, N. Y.

KOUFMAN, William B., 1st Lieut., New Haven, Conn., Hartford, Conn.  
LEVIN, Julius R., 1st Lieut., Burlington, Vt., Camp Edwards, Mass.  
LEVINSON, Samuel S., 1st Lieut., Malden, Mass., Camp Shelby, Miss.  
LEWIS, Henry R., Lieut., M. R. C., Wethersfield, Conn., Camp Forrest, Tenn.  
LEWIS, Samuel D., 1st Lieut., Hartford, Conn., Camp Claiborne, La.  
LISBON, Wallace, 1st Lieut., Providence, R. I., Camp Edwards, Mass.  
McVETTY, Rufus H., 1st Lieut., North Stratford, N. H., Maxwell Field, Ala.  
MALONEY, John D., 1st Lieut., Waverley, Mass., Camp Edwards, Mass.  
MARDER, Samuel H., 1st Lieut., Westboro, Mass., Maxwell Field, Ala.  
MILLER, Himon, 1st Lieut., Providence, R. I., Providence, R. I.  
MOORE, Kenneth T., 1st Lieut., Providence, R. I., Fort Bragg, N. C.  
NATHAN, Edward M., 1st Lieut., Quincy, Mass., Maxwell Field, Ala.  
NORTON, Thomas J., Captain, Pittsfield, Mass., Hartford, Conn.  
OTIS, Carlos G., 1st Lieut., Townsend, Vt., Camp Claiborne, La.  
PALMER, Edwin J., Captain, M. R. C., Palmer, Mass., Camp Forrest, Tenn.  
POWERS, Michael F., Lieut., M. R. C., Belows Falls, Vt., Fort Oglethorpe, Ga.  
RICCIO, Joseph S., 1st Lieut., Hauden, Conn., Maxwell Field, Ala.  
SANDS, Sidney L., Lieut., M. R. C., Worcester, Mass., Camp Forrest, Tenn.  
SEGAL, Leo, Lieut., M. R. C., North Troy, Vt., Fort Oglethorpe, Ga.  
SHANNON, Edward T., 1st Lieut., Fall River, Mass., Camp Edwards, Mass.  
SHERWIN, Herbert, Captain, Cambridge, Mass., Maxwell Field, Ala.  
SMITH, Gordon B., Lieut., M. R. C., Rutland, Vt., Camp Forrest, Tenn.  
SPIEGEL, Charles M., Lieut., M. R. C., New Haven, Conn., Camp Forrest, Tenn.  
SWEET, Gustaf, 1st Lieut., Providence, R. I., Camp Edwards, Mass.  
THORNE, Lewis, Lieut., M. R. C., New Haven, Conn., Fort Rodman, Mass.  
VERNON, Sidney, Lieut., M. R. C., Willimantic, Conn., Camp Forrest, Tenn.  
WEISMAN, Jacob I., 1st Lieut., Springfield, Mass., Camp Edwards, Mass.  
WEISS, Louis R., 1st Lieut., Brookline, Mass., Fort Oglethorpe, Ga.  
YOUNG, Leo A., 1st Lieut., Fitchburg, Mass., Camp Wheeler, Ga.

## Orders Revoked

ABODEELY, Robert A., 1st Lieut., Worcester, Mass.  
BELLIOU, Joseph L., Lieut.-Col., Providence, R. I.  
FAY, Thomas F., 1st Lieut., Augusta, Me.  
FIELD, Eugene A., 1st Lieut., Providence, R. I.  
HASCALL, Theodore C., Major, Riverside, R. I.  
MAINVILLE, Albert L., Captain, Leominster, Mass.  
MATTERA, Vincent J., 1st Lieut., Providence, R. I.

FINCH, Charles S., Jr., 1st Lieut., Jamaica, L. I., N. Y., Camp Livingston, La.  
FLAHERTY, Morton H., 1st Lieut., White Plains, N. Y., Fort Hancock, N. J.  
FRIEDMAN, Eliot M., 1st Lieut., Utica, N. Y., Fort Ontario, N. Y.  
GANNON, John R., 1st Lieut., Pelham, N. Y., Fort Hancock, N. J.  
GAYDOS, Albert L., 1st Lieut., Brooklyn, Fort Wadsworth, N. Y.  
GLASSMAN, Herman, 1st Lieut., Brooklyn, Fort Bragg, N. C.  
GLICK, Bernard, Captain, Brooklyn, Camp Claiborne, La.  
GREELEY, Horace, Jr., 1st Lieut., Brooklyn, Fort Dix, N. J.  
GREXLEY, Philip, 1st Lieut., Brooklyn, Fort Niagara, N. Y.  
GRILHAS, Morris, 1st Lieut., Brooklyn, Camp Blanding, Fla.  
GROSS, Joseph M., 1st Lieut., Brooklyn, Fort Bragg, N. C.  
GUTIN, Morton L., 1st Lieut., Brooklyn, Fort Niagara, N. Y.  
HALPERIN, Barnet, 1st Lieut., Brooklyn, Fort Bragg, N. C.  
HARRIS, William L., 1st Lieut., Kings Park, L. I., N. Y., Fort Benning, Ga.  
HARTMANN, Alfred A., 1st Lieut., Malone, N. Y., Plattsburg Barracks, N. Y.  
HARTMANN, Edmund M., 1st Lieut., Jamaica, L. I., N. Y., Fort Benning, Ga.  
HARWOOD, Mark R., 1st Lieut., Dexter, N. Y., Madison Barracks, N. Y.  
HUBBARD, Oscar E., 1st Lieut., Buffalo, Fort Bragg, N. C.  
JAGODA, Leonard S., 1st Lieut., New York, Fort Jackson, S. C.  
JOSEPHSON, Frederick, 1st Lieut., Flushing, L. I., N. Y., Fort Hamilton, N. Y.  
KAPLAN, Eugene S., 1st Lieut., Brooklyn, Camp Livingston, La.  
KAPLAN, Jack A., 1st Lieut., Jersey City, N. J., Fort Bragg, N. C.  
KAPLAN, Samuel D., 1st Lieut., Hillside, N. J., Fort Bragg, N. C.



KAUFMAN, Robert E., 1st Lieut., New York, Fort Benning, Ga.  
KELLEHER, Dennis A., 1st Lieut., Brooklyn, Fort Monmouth, N. J.  
KINDER, Frederick, 1st Lieut., New York, Camp Forest, Tenn.  
KLEINFELD, Morris, 1st Lieut., Brooklyn, Pine Camp, N. Y.  
KRON, William L., 1st Lieut., Brooklyn, Induction Station, Buffalo.  
LANG, Sydney L., 1st Lieut., Staten Island, N. Y., Fort Monmouth, N. J.  
LARKIN, Edward A., 1st Lieut., Amenia, N. Y., Fort DuPont, Del.  
LEIDOWITZ, Harry, Captain, Brooklyn, N. Y., Camp Livingston, La.  
LEVENSTEIN, Louis S., 1st Lieut., Bronx, N. Y., Camp Livingston, La.  
LEWIS, Fredric, 1st Lieut., New York, Plattsburg Barracks, N. Y.  
LIEBERMAN, Leo A., Captain, New York, Fort Bragg, N. C.  
LOCASCIO, Nicholas R., Captain, Bronx, N. Y., Fort Hancock, N. J.  
LORENZO, James V., 1st Lieut., Brooklyn, Camp Claiborne, La.  
MCARTHUR, John J., 1st Lieut., Elmhurst, L. I., N. Y., Pine Camp, N. Y.  
MCKNIGHT, William K., Captain, White Plains, N. Y., Camp Upton, N. Y.  
MAILLARD, Leslie W., 1st Lieut., Flushing, L. I., N. Y., Fort Wadsworth, N. Y.  
MALINS, Maurice L., 1st Lieut., New York, Madison Barracks, N. Y.  
MASCALI, Angelo, 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.  
MASTELLONE, Aniello F., 1st Lieut., New York, Fort Bragg, N. C.  
MELLOW, Joseph A., 1st Lieut., New York, Fort Dix, N. J.  
MESSINGER, Emanuel, 1st Lieut., Jamaica, L. I., N. Y., Induction Station, Fort Jay, N. Y.  
MILLS, Clifford W., 1st Lieut., New York, Camp Croft, S. C.  
MORRONE, Francis X., 1st Lieut., Yonkers, N. Y., Fort Bragg, N. C.  
MULHOLLAND, Herbert, 1st Lieut., Far Rockaway, N. Y., Pine Camp, N. Y.  
MULLAN, Hugh, 1st Lieut., Stapleton, S. I., N. Y., Fort Benning, Ga.  
NEICHIN, Sudney N., 1st Lieut., Brooklyn, Fort Monmouth, N. J.  
NUESKE, Frederick W., 1st Lieut., Freeport, L. I., N. Y., Fort Bragg, N. C.  
OESTREICH, Mitchell, 1st Lieut., Brooklyn, Fort Hancock, N. J.  
PARK, Charles L., 1st Lieut., Yonkers, N. Y., Fort Bragg, N. C.  
PLOTKIN, Jacob B., Major, Brooklyn, Fort Dix, N. J.  
PORT, Murray, 1st Lieut., New York, Camp Livingston, La.  
PRESTON, William O., Captain, New York, Camp Blanding, Fla.  
PRINCE, Arthur, Captain, Tuckahoe, N. Y., Fort DuPont, Del.  
PSAKI, Constantine G., Captain, Forrest Hills, N. Y., Induction Station, Buffalo.  
RAPPA, James E., 1st Lieut., Brooklyn, Fort Benning, Ga.  
REISER, Paul, 1st Lieut., New York, Fort Bragg, N. C.  
ROBINSON, Arthur, 1st Lieut., New York, Fort Bragg, N. C.  
ROCK, Roger J., 1st Lieut., Brooklyn, Fort Bragg, N. C.  
ROTHMAN, Albert, 1st Lieut., Syracuse, N. Y., Fort Niagara, N. Y.  
RUBENFELD, Sidney, 1st Lieut., New York, Fort Hancock, N. J.  
RUBIN, Abraham, 1st Lieut., Brooklyn, Fort Jackson, S. C.  
SAFRAN, Nathaniel, 1st Lieut., Flushing, L. I., N. Y., Fort Slooem, N. Y.

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

CARDWELL, Edward S., Jr., 1st Lieut., Memphis, Tenn., Fort Jackson, S. C.  
CARITHERS, Hugh A., Jr., 1st Lieut., Winder, Ga., Fort Bragg, N. C.  
CHAPMAN, Charles Granger, 1st Lieut., Columbia, S. C., Camp Livingston, La.  
CORRELL, William C., 1st Lieut., Memphis, Tenn., Camp Polk, La.  
FERBER, Leon, 1st Lieut., Nashville, Tenn., Camp Claiborne, La.  
FRANCIS, John Joseph, 1st Lieut., New Orleans, Camp Claiborne, La.  
GOWER, Orien Thomas, Jr., 1st Lieut., Cordele, Ga., Camp Grant, Ill.  
HENRY, Jennings L., 1st Lieut., Atlanta, Ga., Camp Davis, N. C.  
HENRY, John Arnold, 1st Lieut., Atlanta, Ga., Camp Blanding, Fla.  
JORDAN, William K., 1st Lieut., Milledgeville, Ga., Camp Davis, N. C.  
KRON, John Louis, Jr., 1st Lieut., New Orleans, Camp Davis, N. C.  
LAW, Edward H., Jr., 1st Lieut., Columbia, S. C., Camp Claiborne, La.  
McCULLOUGH, George C., 1st Lieut., Birmingham, Ala., Camp Shelby, Miss.  
NEIGHBORS, Joseph B., Jr., 1st Lieut., Macon, Ga., Camp Blanding, Fla.  
OVERSTREET, Ralph M., Jr., 1st Lieut., Miami, Fla., Camp Stewart, Ga.  
PUGH, William W., Jr., 1st Lieut., Napoleonville, La., Camp Polk, La.  
ROUGELOT, Robert Emile, 1st Lieut., New Orleans, Fort Oglethorpe, Ga.

#### SIXTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Sixth Corps Area, which comprises the states of Wisconsin, Illinois and Michigan:

AGIN, Lambert J., 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.  
ALEXANDER, Martin M., 1st Lieut., Detroit, Selfridge Field, Mount Clemens, Mich.  
BARKETT, Soddie J., 1st Lieut., Cairo, Ill., Scott Field, Ill.  
BINDER, Paul, 1st Lieut., Chicago, Scott Field, Ill.  
BIRNDORF, Leonard, 1st Lieut., Detroit, 27th Division, Fort McClellan, Ala.

SANTORO, George R., 1st Lieut., West Brighton, S. I., N. Y., Fort Hamilton, N. Y.  
SAX, Charles E., 1st Lieut., Paterson, N. J., Camp Blanding, Fla.  
SCHACHNO, Joseph, 1st Lieut., Brooklyn, Camp Claiborne, La.  
SCHILDKRAUT, Milton, 1st Lieut., Bronx, N. Y., Camp Croft, S. C.  
SCHOFIELD, Oscar, 1st Lieut., Brooklyn, Camp Claiborne, La.  
SCHWARTZ, Marcus, Captain, White Plains, N. Y., Induction Station, Fort Jay, N. Y.  
SCHWARTZ, Serge D., 1st Lieut., New York, Fort Bragg, N. C.  
SHAW, Edward, 1st Lieut., New York, Plattsburg Barracks, N. Y.  
SIEGEL, Edward, 1st Lieut., Poughkeepsie, N. Y., Plattsburg Barracks, N. Y.  
SOLOMON, Marvin N., 1st Lieut., Bronx, N. Y., Fort Jackson, S. C.  
SOLOVAY, Hyman, 1st Lieut., Brooklyn, Camp Blanding, Fla.  
STACK, Harry G., Captain, Brooklyn, Induction Station, Fort Jay, N. Y.  
STANTON, Edwin Y., 1st Lieut., Flushing, L. I., N. Y., Fort Hamilton, N. Y.  
STARKE, Charles W., 1st Lieut., Flushing, L. I., N. Y., Camp Upton, N. Y.  
STECKLER, Julius, 1st Lieut., New York, Camp Claiborne, La.  
STELMAN, Henry H., Captain, Buffalo, Fort Niagara, N. Y.  
STIVALA, George J., 1st Lieut., New York, Camp Blanding, Fla.  
STOLL, Bernard, 1st Lieut., Brooklyn, Camp Croft, S. C.  
STROTZ, Charles M., Lieut. Col., Lyons, N. J., Plattsburg Barracks, N. Y.  
SUSKIN, Samuel, 1st Lieut., Bronx, N. Y., Plattsburg Barracks, N. Y.  
TADDEO, Mario C., 1st Lieut., Bronx, N. Y., Fort Bragg, N. C.  
TAUSIG, Daniel P., 1st Lieut., New York, Fort Benning, Ga.  
THORNE, Irving J., 1st Lieut., New York, Fort Benning, Ga.  
TOPPERMAN, Samuel, 1st Lieut., Otisville, N. Y., Camp Stewart, Ga.  
TURNER, Oscar A., 1st Lieut., Brooklyn, Fort Bragg, N. C.  
VACCA, Joseph G., 1st Lieut., Kingston, N. Y., Fort Jackson, S. C.  
VALENTI, Frank D., 1st Lieut., New York, Camp Claiborne, La.  
VIOLE, Lawrence E., 1st Lieut., Great Kills, S. I., N. Y., Camp Stewart, Ga.  
WASSERMAN, Seymour H., 1st Lieut., Brooklyn, Fort Moultrie, S. C.  
WELLER, Milton J., 1st Lieut., Brooklyn, Plattsburg Barracks, N. Y.  
WILLINGER, Hyman, Captain, Bronx, N. Y., Fort Dix, N. J.  
WOLTMANN, Charles E., 1st Lieut., Hoboken, N. J., Induction Station, Buffalo.  
ZIPPEN, George J., 1st Lieut., New York, Fort Barrancas, Fla.

#### CORRECTION

Captain Zukauckas.—In the list of reserve officers ordered to active duty under the Second Corps Area in THE JOURNAL May 3, page 2061, Edward W. Zukauckas of Brooklyn was listed as a first lieutenant serving at Fort Dix, N. J., when he should have been listed as a captain.

#### Orders Revoked

ASSEY, Philip E., 1st Lieut., Georgetown, S. C.  
GREEN, Albert H., Major, Birmingham, Ala.  
MATHIAS, Marion L., 1st Lieut., Charleston, S. C.  
MORROGH, Lailor A., Jr., 1st Lieut., Breaux Bridge, La.  
NOLAN, Lewis E., Captain, St. Petersburg, Fla.  
NOTO, Joseph J., 1st Lieut., Baton Rouge, La.  
SCOTT, William S., 1st Lieut., Spartanburg, S. C.  
STANFIELD, William W., 1st Lieut., Dunn, N. C.  
WAGNER, Rudolph T., 1st Lieut., Miami Beach, Fla.

#### Relieved from Duty

BRACKSTONE, LeRoy B., 1st Lieut., Iuka, Miss.  
CARDWELL, Edward S., Jr., 1st Lieut., Memphis, Tenn.  
DAVIS, Charles W., Jr., 1st Lieut., Humboldt, Tenn.  
MARTIN, Marion T., 1st Lieut., Memphis, Tenn.

BOHORFOUSH, Joseph G., 1st Lieut., Madison, Wis., Air Corps Basic Flying School, San Angelo, Texas.  
BOICE, William A., Captain, Chicago, 5th Division, Fort Custer, Mich.  
BOOTHBY, Carl F., 1st Lieut., Lawrence, Mich., Selfridge Field, Mount Clemens, Mich.  
CAPLAN, Leslie, 1st Lieut., Detroit, Randolph Field, Texas.  
CHIPMAN, Elwood M., 1st Lieut., Quincy, Mich., Medical Battalion, 5th Division, Fort Custer, Mich.  
CONGER, Kyriel B., 1st Lieut., Ann Arbor, Mich., Air Base, Tucson, Ariz.  
COOPER, George J., 1st Lieut., Chicago, 11th Station Hospital, Fort Custer, Mich.  
COVELL, Kermit W., 1st Lieut., Racine, Wis., Air Base, Albuquerque, N. M.

DILLAHUNT, Jack A., 1st Lieut., Detroit, 27th Division, Fort McClellan, Ala.  
 DVORAK, Harold J., Captain, Milwaukee, 5th Division, Fort Custer, Mich.  
 ERBES, John, 1st Lieut., Milwaukee, Armored Force Troop Unit, Fort Benning, Ga.  
 FAULCONER, Albert, 1st Lieut., Rochester, Mich., Station Hospital, Fort Custer, Mich.  
 GEARHART, Robert S., 1st Lieut., Madison, Wis., Station Hospital, Fort Sill, Okla.  
 GIARDINA, Jacob J., 1st Lieut., Chicago, Air Base, Tucson, Ariz.  
 GREENBERG, Harold A., Captain, Chicago, 5th Division, Fort Custer, Mich.  
 GREENWOOD, Robert C., 1st Lieut., Chicago, Randolph Field, Texas.  
 HAMILTON, Earl E., 1st Lieut., Traverse City, Mich., Selfridge Field, Mount Clemens, Mich.  
 HARLEY, Garth H., 1st Lieut., Detroit, Station Hospital, Fort Sill, Okla.  
 HARRISON, Rollie M., 1st Lieut., Chicago, Scott Field, Ill.  
 JOACHIM, Frederick G., 1st Lieut., Madison, Wis., Chanute Field, Rantoul, Ill.  
 KAPLAN, Benjamin, 1st Lieut., Chicago, Air Base, Tucson, Ariz.  
 KIRGIS, Harold J., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.  
 KRAUSE, Charles D., 1st Lieut., Chicago, Air Base, Oklahoma City.  
 LANE, Milton, 1st Lieut., Bay City, Mich., 27th Division, Fort McClellan, Ala.  
 LANSKY, Mandell, 1st Lieut., Detroit, 27th Division, Fort McClellan, Ala.  
 LEWIS, Raymond O., 1st Lieut., West Detroit, Mich., Chanute Field, Rantoul, Ill.  
 McCLAY, Elmo Todd, 1st Lieut., Springfield, Ill., Chanute Field, Rantoul, Ill.

MATZNER, Irving A., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.  
 MEETER, Urquhart L., 1st Lieut., Oshkosh, Wis., Chanute Field, Rantoul, Ill.  
 MITCHELL, George T., 1st Lieut., Marshall, Ill., Air Base, Albuquerque, N. M.  
 NADHERNY, George C., 1st Lieut., Cicero, Ill., Chanute Field, Rantoul, Ill.  
 NIVER, Edwin O., 1st Lieut., Eau Claire, Wis., Station Hospital, Fort Custer, Mich.  
 PELKEY, George L., 1st Lieut., Chicago, U. S. Army Induction Station, Chicago.  
 PETERSON, Stanley C., 1st Lieut., Luck, Wis., Randolph Field, Texas.  
 PINNE, George F., Jr., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.  
 REHNER, Robert C., 1st Lieut., Ann Arbor, Mich., 27th Division, Fort McClellan, Ala.  
 RICHARDS, Ned W., 1st Lieut., Saginaw, Mich., Station Complement, Camp Davis, N. C.  
 SCHREIBER, Manuel, 1st Lieut., Chicago, Scott Field, Ill.  
 SCHWARTZ, Louis B., 1st Lieut., Manteno, Ill., Randolph Field, Texas.  
 SOSSON, Edward, 1st Lieut., Chicago, Air Base, Oklahoma City.  
 STEIN, Edward, 1st Lieut., Detroit, Air Base, Albuquerque, N. M.  
 SZABO, Stephen A., 1st Lieut., Chicago, Chanute Field, Rantoul, Ill.  
 THOMSON, Daniel C., 1st Lieut., Ann Arbor, Mich., Air Base, Oklahoma City.  
 UNCAPHER, Rex P., 1st Lieut., Evanston, Ill., U. S. Army Induction Station, Peoria, Ill.  
 WEINSHEL, Leo R., 1st Lieut., Milwaukee, Scott Field, Ill.  
 WEINSTEIN, Roy C., 1st Lieut., Chicago, Air Base, Tucson, Ariz.  
 WERNER, Jerome J., 1st Lieut., Milwaukee, U. S. Army Induction Station, Milwaukee.

### SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

ADLER, Morton W., 1st Lieut., St. Louis, Mo., Fort Snelling, Minn.  
 BLACKER, Morris Roland, 1st Lieut., Wichita, Kan., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.  
 BRILLHART, Everett G., 1st Lieut., Shelby, Neb., Camp Joseph T. Robinson, Ark.  
 CATEY, Robert Massey, 1st Lieut., Mobridge, S. D., Corps Area Service Command Reception Center Infirmary, Jefferson Barracks, Mo.  
 CIMEFEL, Adolph Bohumil, 1st Lieut., M. R. C., Scotia, Neb., Corps Area Service Command Replacement Center Infirmary, Fort Leonard Wood, Mo.  
 CLARK, Richardson Evans, 1st Lieut., Manchester, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
 CRAWFORD, William H., Major, Omaha, Fort Ord, Calif.  
 DYSTERHEFT, Adolf, Captain, Gaylord, Minn., Cavalry Replacement Center Infirmary, Fort Riley, Kan.  
 EDINGTON, Frank Dennis, Major, Spencer Iowa, Corps Area Service Command Station Hospital, Jefferson Barracks, Mo.  
 EGLEY, Loren Edward, 1st Lieut., Maryville, Mo., 85th Field Artillery, Camp Roberts, Calif.  
 ELIAS, Houghton Francis, Captain, Beatrice, Neb., Corps Area Service Command Station Hospital, Fort Crook, Neb.  
 EMOND, Joseph Samuel, Captain, Farmington, Minn., 155th Station Hospital, Camp Roberts, Calif.  
 GILFILLAN, Clarence David Neuton, 1st Lieut., M. R. C., Eldon, Iowa, Corps Area Service Command Engineer Replacement Training Center Infirmary, Fort Leonard Wood, Mo.  
 GREENE, Arthur Morton, 1st Lieut., Omaha, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
 HANKS, Ralf, 1st Lieut., Fulton, Mo., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.  
 HAUGE, Erling Trygve, 1st Lieut., Minneapolis, 1st Cavalry Division, Fort Bliss, Texas.  
 HAVEL, Harold William, 1st Lieut., M. R. C., Jordan, Minn., Field Artillery, 2d Cavalry Division, Fort Riley, Kan.  
 HEINEMANN, Sol, 1st Lieut., Newport, Ark., 178th Field Artillery, Fort Bragg, N. C.  
 HOLLAND, Cleon Richard, 1st Lieut., Minneapolis, Corps Area Service Command Cavalry Replacement Center Infirmary, Fort Riley, Kan.  
 KELSEY, Kenneth Lawrence, 1st Lieut., M. R. C., Aurora, Mo., Corps Area Service Command Station Hospital, Fort Meade, S. D.  
 KIRKLAND, Samuel Sylvester, 1st Lieut., Marshall, Ark., 42d Evacuation Hospital, Fort Leonard Wood, Mo.

KLEINE, Hans Louis, Major, St. Louis, Medical Detachment, 63d Infantry, Fort Leonard Wood, Mo.  
 KYGER, Edgar Ross, Jr., 1st Lieut., M. R. C., Kansas City, Mo., Field Artillery, 2d Cavalry Division, Fort Riley, Kan.  
 LOTMAN, Harry A., 1st Lieut., Lincoln, Neb., Camp Shelby, Miss.  
 MAGNESS, Guy Norton, Captain, M. R. C., University City, Mo., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.  
 MARTIN, Melvin C., Captain, Newton, Kan., Fort Custer, Mich.  
 MERZ, Jean Joseph, 1st Lieut., M. R. C., St. Louis, Field Artillery, 2d Cavalry Division, Fort Riley, Kan.  
 MOONEY, Robert Davis, 1st Lieut., St. Paul, Corps Area Service Station Hospital, Fort Leonard Wood, Mo.  
 MOORE, Robert Hollingsworth, 1st Lieut., Lansing, Kan., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.  
 NEVITT, James Russell, Captain, M. R. C., Moran, Kan., Field Artillery, 2d Cavalry Division, Fort Riley, Kan.  
 PRACHAR, Gordon Allen, 1st Lieut., Madison, Neb., 53d Evacuation Hospital, Camp San Luis Obispo, Calif.  
 PRUSNACK, John Jacob, Clarinda, Iowa, Corps Area Service Command Induction Station, Jefferson Barracks, Mo.  
 RAINES, Oney Carstaffen, Jr., 1st Lieut., St. Louis, 114th General Hospital, Camp J. T. Robinson, Ark.  
 READER, Donald Richard, 1st Lieut., Fergus Falls, Minn., Corps Area Service Command Induction Station, Fort Snelling, Minn.  
 ROGERS, Charles Wesley, 1st Lieut., M. R. C., Heron Lake, Minn., Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.  
 RYAN, Michael Joseph, 1st Lieut., Kansas City, Kan., Corps Area Service Command Induction Station, Fort Des Moines, Iowa.  
 SEAMEN, Charles LeRoy, 1st Lieut., Mount Ayr, Iowa, 4th Cavalry, Fort Meade, S. D.  
 SWIFT, Charles Henry Jr., 1st Lieut., Marcus, Iowa, 1st Cavalry Division, Fort Bliss, Texas.  
 TURNER, Wylie Erasmus, 1st Lieut., M. R. C., Piggott, Ark., Corps Area Service Command Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.  
 WOOD, Bennett Raymond, 1st Lieut., St. Louis, Corps Area Service Command Induction Station, Jefferson Barracks, Mo.  
 UTLEY, Francis Edward, Jr., 1st Lieut., Blytheville, Ark., 4th Cavalry, Fort Meade, S. D.

### Orders Revoked

CORN, Henry H., 1st Lieut., Des Moines, Iowa.  
 GREENBERG, Maynard Maurice, Captain, Omaha, Fort Leonard Wood, Mo.  
 KNOLL, William, 1st Lieut., Hot Springs, S. D.  
 McKINSTRY, Karl Virgil, 1st Lieut., De Soto, Mo., 3d Cavalry Brigade, Fort Riley, Kan.  
 SATTERFIELD, Benjamin W., 1st Lieut., St. Louis, 4th Cavalry Brigade, Fort Riley, Kan.

### EIGHTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Eighth Corps Area, which comprises the states of Colorado, Arizona, New Mexico, Oklahoma and Texas:

ALLEN, Lloyd R., Lieut. Col., Colorado Springs, Colo., Selective Service System, Santa Fe, N. M.  
 ARMBRUST, Charles A., Jr., 1st Lieut., Dallas, Texas, 2d Division, Fort Sam Houston, Texas.  
 BANGEMAN, John O., 1st Lieut., LaJunta, Colo., Station Hospital, Fort Bliss, Texas.  
 BENSON, John C., Jr., 1st Lieut., El Paso, Texas, Station Hospital, Fort Bliss, Texas.

BLOCK, Herbert Edward, 1st Lieut., Fort Sam Houston, Texas, 2d Division, Fort Sam Houston, Texas.  
 BOEHM, William, 1st Lieut., Denver, 2d Division, Fort Sam Houston, Texas.  
 BRASELTON, Charles W., Jr., 1st Lieut., Fort Worth, Texas, 82d Field Artillery, Fort Bliss, Texas.  
 BURDITT, Bucky Lee, 1st Lieut., Dallas, Texas, 2d Division, Fort Sam Houston, Texas.  
 BUSH, Jordan Morgan, 1st Lieut., Oklahoma City, Station Hospital, Fort Sill, Okla.  
 CAVANAUGH, John W., 1st Lieut., Oklahoma City, 200th Cavalry Artillery (AA), Fort Bliss, Texas.  
 CONNALLY, Herschel F., Jr., 1st Lieut., Waco, Texas, Station Hospital, Fort Sill, Okla.  
 CROXDALE, Edward Lee, 1st Lieut., Denver, 25th Infantry, Fort Huachuca, Ariz.

DANIELS, Bernard T., 1st Lieut., Denver, Corps Area Service Command, Camp Normoyle, Texas.  
FARNAM, Lorenzo Matthew, Jr., 1st Lieut., Oklahoma City, 36th Division, Camp Bowie, Texas.  
FAYLE, Percy Riley, 1st Lieut., Houston, Texas, Station Hospital, Fort Sam Houston, Texas.  
GANDY, William M., 1st Lieut., Houston, Texas, 202d Coast Artillery (AA), Fort Bliss, Texas.  
GIBSON, Hester M., Jr., 1st Lieut., Lubbock, Texas, 112th Cavalry, Fort Clark, Texas.  
HAYNES, Henry M., Jr., 1st Lieut., Gatesville, Texas, Station Hospital, Fort Sam Houston, Texas.  
HODGES, Tom Wiley, 1st Lieut., Boston, Station Hospital, Fort Bliss, Texas.  
HOUSE, Royce Eugene, 1st Lieut., Dallas, Texas, 2d Division, Fort Sam Houston, Texas.  
ISBERG, Emil Mark, 1st Lieut., Denver, 25th Infantry, Fort Huachuca, Ariz.  
ISEN, Paul Jonathan, 1st Lieut., Waco, Texas, 52d Signal Battalion, Fort Sam Houston, Texas.  
JONES, Leonard B., 1st Lieut., Taft, Texas, Station Hospital, Fort Sill, Okla.  
KAHN, Robert W., 1st Lieut., St. Louis, 45th Division, Camp Berkeley, Texas.  
KEARNS, Harry Joseph, 1st Lieut., Cripple Creek, Colo., 77th Field Artillery, Fort D. A. Russell, Texas.  
KENDIG, Thomas A., 1st Lieut., Safford, Ariz., Station Hospital, Fort Sam Houston, Texas.  
KERR, Walter C. H., 1st Lieut., Picher, Okla., 113th Cavalry, Camp Bowie, Texas.  
KLOTZ, William F., Captain, McAlester, Okla., Station Hospital, Fort Sam Houston, Texas.  
KOFF, Salmon Arthur, Major, Fort Bayard, N. M., Station Hospital, Fort Bliss, Texas.  
LEWIN, Julian R., 1st Lieut., Redvale, Colo., Camp Grant, Ill.  
LEY, Eugene B., 1st Lieut., Oklahoma City, Station Hospital, Camp Wolters, Texas.  
LYDAY, Victor Ivan, 1st Lieut., Dallas, Texas, Corps Area Laboratory, Fort Sam Houston, Texas.  
MAHONE, Marion Wilson, 1st Lieut., Houston, Texas, 202d Coast Artillery (AA), Fort Bliss, Texas.  
MARKOWITZ, Allan E., 1st Lieut., Abilene, Texas, 36th Division, Camp Bowie, Texas.  
MARTINAK, Richard F., 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.  
MAXFIELD, George S., 1st Lieut., Waco, Texas, Station Hospital, Fort Bliss, Texas.  
MAYO, Oscar N., Major, Brownwood, Texas, Station Hospital, Camp Wallace, Texas.  
MERVYNNE, Robert Duncan, 1st Lieut., Phoenix, Ariz., 25th Infantry, Fort Huachuca, Ariz.  
MILLER, Walter S., Jr., 1st Lieut., Laredo, Tex., Camp Grant, Ill.  
MILLS, Edward K., 1st Lieut., Dallas, Texas, Station Hospital, Fort Sam Houston, Texas.

MOFFATT, Thomas William, 1st Lieut., Denver, 2d Division, Fort Sam Houston, Texas.  
MOFFITT, Lauri W., 1st Lieut., Tucson, Ariz., Station Hospital, Fort Sam Houston, Texas.  
MURRY, Abel V., 1st Lieut., Picher Okla., 260th Corps Area, Fort Bowie, Texas.  
PHELAN, Ralph Stewart, 1st Lieut., Houston, Texas, 36th Division, Camp Bowie, Texas.  
ROBERTS, Joe Henry, 1st Lieut., Houston, Texas, 36th Division, Camp Bowie, Texas.  
ROBINSON, Webber T., 1st Lieut., Philadelphia, 36th Division, Camp Bowie, Texas.  
SCHUBERT, Herbert A., 1st Lieut., Washington, D. C., 45th Division, Camp Berkeley, Texas.  
SHAFFER, Troy A., 1st Lieut., Harlingen, Texas, 36th Division, Camp Bowie, Texas.  
SHANNON, Manning, 1st Lieut., Cleveland, Station Hospital, Fort Sam Houston, Texas.  
SHAW, Guy G., Jr., 1st Lieut., Shreveport, La., 2d Division, Fort Sam Houston, Texas.  
SHELTON, E. L., Jr., 1st Lieut., Richmond, Va., 45th Division, Camp Berkeley, Texas.  
SHERE, Norbert L., 1st Lieut., Denver, 36th Division, Camp Bowie, Texas.  
SPARK, Milton, 1st Lieut., Waco, Texas, 202d Coast Artillery (AA), Fort Bliss, Texas.  
TWINEHAM, Walter C., 1st Lieut., El Paso, Texas, Station Hospital, Fort Bliss, Texas.  
WHEELER, Homer C., 1st Lieut., St. Louis, Station Hospital, Fort Sill, Okla.

#### Orders Revoked

ANTHONY, William Dodd, 1st Lieut., Gallup, N. M.  
CAIRNS, Arthur Buell, 1st Lieut., Dallas, Texas.  
CALONGE, Guy E., 1st Lieut., LaJunta, Colo.  
CLARK, Ralph O., 1st Lieut., Oklahoma City.  
COGBURN, Charles Cnewton, 1st Lieut., Nixon, Texas.  
DOWNING, Gerald G., 1st Lieut., Lawton, Okla.  
FRANK, Charles H., Captain, Texarkana, Texas.  
GRUMBLES, Ernest W., 1st Lieut., Atlanta, Texas.  
HARTGRAVES, Thos. A., Major, Phoenix, Ariz.  
HOOKER, Lyle, 1st Lieut., Houston, Texas.  
HYDE, William A., 1st Lieut., Durant, Okla.  
IVY, J. B., 1st Lieut., Weslaco, Texas.  
LAPAN, Charles H., 1st Lieut., Lamar, Colo.  
LENOX, Walter Riley, 1st Lieut., Fort Worth, Texas.  
McKINSEY, S. Joe, Captain, McAllen, Texas.  
NEWSOM, Robert Lee, 1st Lieut., Munday, Texas.  
PRYOR, V. W., 1st Lieut., Holdenville, Okla.  
SCHULSE, Roscoe, 1st Lieut., Schulenburg, Texas.  
WILLIAMS, Harold Murphy, 1st Lieut., Fort Worth, Texas.  
WOOLF, Jack I., 1st Lieut., Dallas, Texas.  
WYATT, Malcolm H., 1st Lieut., Amarillo, Texas.

### BED CAPACITY OF ARMY HOSPITALS

The U. S. Army will have nine new general hospitals by the end of 1941, according to a report prepared by the Construction Division of the Office of the Quartermaster General. In addition, there are one hundred and thirty-three post hospitals on various military reservations throughout the country.

Of the total of thirteen general hospitals, which will have thirteen thousand, seven hundred and fifty-eight beds, four are established, six were recently completed and three are under construction.

The post hospitals have a total of sixty-five thousand five hundred beds and they are equipped to handle any kind of medical or surgical case. The post hospitals are established, however, with the view of handling short-time patients. The general hospitals receive patients requiring long confinement, patients suffering from chronic ailments and, where it is possible to move over, with the view of handling short-time patients. The general hospitals are located in important cities or army posts which are easily accessible to troops stationed in their particular part of the country.

In addition to maintaining the highest standards of medical science, the hospitals are equipped with the most modern utilities—electrical equipment, water supply, sewage disposal plants and systems, heating, laundries, kitchens and fire protection.

The following general hospitals have been completed recently:

Hospitals	Bed Capacity
Barnes General Hospital, Vancouver Barracks, Washington.....	750
Lawson General Hospital, Chamblee, near Atlanta, Ga.....	2,000
LaGarde General Hospital, New Orleans.....	1,000
Stark General Hospital, Charleston, S. C.....	1,000
Hoff General Hospital, Santa Barbara, Calif.....	750
Billings General Hospital, Fort Benjamin Harrison, Ind.....	1,000

At the Stark General Hospital—generally regarded as a model institution in the South—four accessory buildings are to be constructed. They are a hospital barracks, Red Cross

recreation building, ambulance garage and administration building. The hospital takes up 30 acres of ground and is surrounded by a 319 acre tract also owned by the government.

The hospitals still under construction are as follows:

Hospitals	Date of Completion	Bed Capacity
O'Reilly General Hospital, Springfield, Mo., Aug. 24, 1941.....		1,000
Tilton General Hospital, Fort Dix, N. J., uncertain.....		1,000
Lovell General Hospital, Fort Devens, Mass., uncertain.....		1,000

The following are the long-established general hospitals of the army in continental United States:

Hospitals	Bed Capacity
Letterman General Hospital, San Francisco.....	1,204
Fitzsimons General Hospital, Denver.....	1,458
Army and Navy General Hospital, Hot Springs, Ark.....	412
Walter Reed General Hospital, Washington, D. C.....	1,184

### ARMY'S PHYSICAL THERAPY COURSE TO BE SHORTENED

Because of the great demand made on the Army's Physical Therapy School for trained personnel to staff new hospitals, the school's one year course for physical therapy aids will be reduced to six months on July 1. It is contemplated that the students will then be sent to Army hospitals for an additional six months of practical supervised training. The school is conducted at the Army Medical Center, Washington, D. C., and has graduated two hundred and twenty-five young women since it was inaugurated in 1922.

### GENERAL WILLIS TO COMMAND REPLACEMENT CENTER

Brig. Gen. John M. Willis, M. C., United States Army, has been assigned to command the Medical Department Replacement Center at Camp Grant, Rockford, Ill.

# ORGANIZATION SECTION

## PROCEEDINGS OF THE CLEVELAND SESSION

MINUTES OF THE NINETY-SECOND ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION, HELD IN CLEVELAND, JUNE 2-6, 1941

### HOUSE OF DELEGATES

#### *First Meeting—Monday Morning, June 2*

The House of Delegates convened in the Euclid Ball Room of the Hotel Statler and was called to order at 10 a. m. by the Speaker, Dr. H. H. Shoulders.

#### Preliminary Report of the Reference Committee on Credentials

A preliminary report of the Reference Committee on Credentials was submitted by the chairman, Dr. G. Henry Mundt, Illinois, who reported that one hundred and thirty delegates with proper credentials had registered.

Dr. Mundt moved that Drs. A. R. McComas and R. L. Diveley, Missouri, whose names are included on the official list but who did not present credentials, be seated. The motion was seconded by Dr. A. T. McCormack, Kentucky, and carried.

Dr. Mundt later stated that additional delegates with proper credentials had registered, making a total of one hundred and fifty-two at this time.

#### Roll Call

The Secretary called the roll and announced that a quorum was present.

#### Distinguished Service Award

Dr. Arthur W. Booth, Chairman of the Board of Trustees, presented the following report:

The Committee on Distinguished Service Awards of the American Medical Association submitted five names to the Board of Trustees. In accordance with chapter VI, section 5, of the By-Laws, the Board has selected by ballot the following names for presentation to the House of Delegates in alphabetical order: Dr. James Ewing, New York; Dr. Simon Flexner, New York, and Dr. Ludvig Hektoen, Chicago.

The Speaker appointed as tellers Drs. Samuel J. Kopetzky, New York; Olin H. Weaver, Georgia; Leon J. Menville, Louisiana; B. F. Cook, Vermont, and Henry Cook Macatee, District of Columbia.

The tellers spread the ballot, and the Secretary announced that one hundred and fifty-two votes had been cast, of which Dr. Ewing received ninety-one, Dr. Flexner fourteen and Dr. Hektoen forty-seven.

The Speaker declared Dr. James Ewing, who received a majority of the votes cast, to be elected by the House to receive the Distinguished Service Award of the American Medical Association.

#### Adoption of Minutes of New York Session

On motion of Dr. A. T. McCormack, Kentucky, seconded by Dr. John Z. Brown, Utah, and carried, the House dispensed with the reading of the minutes and adopted the minutes as published.

#### Address of the Speaker, Dr. H. H. Shoulders

The Vice Speaker, Dr. R. W. Fouts, Omaha, presided while the Speaker, Dr. H. H. Shoulders, read his address, which was referred to the Reference Committee on Reports of Officers:

*Mr. Speaker, Members of the House of Delegates and Guests:*

I wish first to express to the members of the House my appreciation of the honor and privilege of greeting you again as your presiding officer. I wish especially to acknowledge my

indebtedness to you for your forbearance toward my shortcomings.

It is the desire and purpose of your Speaker to cooperate with the membership of the House in such a way that the actions taken on every matter presented will truly reflect the deliberate judgment of the House. Trick parliamentary procedures may have a place in political assemblies, but not here.

At this time I wish to pose a question and then answer it very briefly. The question is this: Whom do you, as Delegates, represent? It is more accurate to state the question in this form: What interest or interests do you represent? It is true, of course, that you represent the more than one hundred and eighteen thousand doctors who sent you here. But what interest of theirs do you represent? Is it a selfish pecuniary interest? Or is it their ideas and ideals with regard to medicine as an agency for human welfare?

A Representative in the national Congress represents the interests of his constituents. It appears that their political and economic interests are uppermost in his mind. His effectiveness as a representative, it seems to me, is too often measured by the number and the amount of the appropriations he obtains for projects in his district. You represent no such interest. You make no such appropriations. You do not even vote as to the amount of the fee a single constituent you represent may charge for a single item of service he may render. Furthermore, your effectiveness as a representative cannot be measured in terms of financial or political benefits to your constituents, either direct or indirect. A careful review of the actions of this House on many matters touching this question, over a long period of years, it seems to me, would lead any unbiased person to the conclusion that it is the ideas and ideals of the medical profession with regard to medicine which you represent, and that in no sense do you represent the selfish pecuniary interests of doctors. It is true that you represent the science and art of medicine as an agency for human welfare. You do not, however, represent doctors as the owners of the science of medicine. Doctors do not, and have never pretended that they do, own the science of medicine.

When Abraham Lincoln died, a member of his cabinet walked from the room and said "Abraham Lincoln now belongs to the ages." That phrase, in my opinion, correctly expresses the ownership of the science of medicine. It truly belongs to the ages. Too many different individuals in too many different countries in too many different ages of the world have made contributions to the science of medicine for any nation or any group of citizens anywhere to lay claim to its ownership.

The relationship of the organized profession of medicine to the science of medicine is recognized by all of us as a trusteeship. The attitude displayed by the profession to the science through the ages has been that of a trustee in every sense of the word—guarding with diligence and fidelity something of value for the benefit of others. This book of science has been kept wide open by reason of policies and principles enunciated by this House and observed by the profession. You have erected no barrier of any character which stands in the way of the appropriate use of any medical discovery of proved benefit to a sick person or the public health. On the contrary, your actions have prevented that very thing from happening. In addition you have promoted progress under the influence of such restraints and guidance as make progress safe.

It is to be remembered that the science of medicine, in reality, embraces portions of several sciences, such as chemistry, biology and bacteriology. These are of no earthly use to ailing humanity until they have gone through the long and tedious process of adaptation by which they are made applicable to human needs in a way that is most beneficial and least dangerous. We know better than most people that "everything that is potent for good is also potent for evil." Even the tongue may do harm when "not bridled." The bridle is not used just to stop a horse: it is used to guide him in the way he should go in service and duty. The art of medicine, of course, is an individual accomplishment. The art or skill, if you please, of using a scalpel for the relief of an ailment is as truly an individual accomplishment as the ability to paint a picture or fashion a statue of marble or bronze.

You represent the art of medicine, but in no sense do you represent any selfish interest of the art. You represent those who have by years of study and effort acquired the art. But you do not represent and have never promoted their selfish use of it. In a very real sense you represent the public interest in this science and this art. This public interest has been the concern of the profession and your primary concern in every expression of principle enunciated by you in relation to the application of this science and this art to human needs.

This is a brief and very inadequate statement of the interests you represent. It does in a measure answer the question put. In my opinion all these interests have been represented in this House in such a way as to stimulate a sense of pride in each of us at this moment. It is natural and proper that you should desire and even expect approval of your actions by each and every interest you have so faithfully represented. Your appeal for such approval, however, has been and must be addressed to the higher elements in human nature. You could not address an effective appeal to the lower instincts, if you felt inclined to do so, for the simple reason that you do not possess the means for such an appeal.

Your task is difficult, of course. It is difficult by reason of the nature and variety of all the interests you represent. It calls for qualities of leadership which, to say the least, are a bit unusual at the present time, and an attitude toward your task which is all too unusual. It requires not only a broad knowledge of the broad subject of medicine and its proper uses in relation to human needs, it requires a degree of integrity which money cannot tempt and flattery cannot influence. It requires a courage which stands firmly against odds, apparently overwhelming. It requires wisdom that is born alone of experience. It requires the virtue of charity akin to that which uttered the prayer "Father, forgive them, for they know not what they do." It requires the ability to see human nature as it is: its virtues and its faults; its generosity and its greed; its loves and its hates; its strength and its weakness; its hopes and its fears. It requires vision—a vision which penetrates this tangled maze of conflicting attributes of human nature and envisions the future.

In conclusion may I venture the opinion that the profession of medicine throughout the world, and an increasing number of enlightened lay people in our own land, are placing an increasing faith in and reliance on you for leadership in the solution of problems requiring medical statesmanship.

### In Memoriam

In accordance with the established custom of the House of Delegates of taking official notice of the death of Fellows who have served the Association in official capacities, either as members of the House or as officers of the Association, the Speaker called the roll of those who have passed away since the House met in June of 1940, as follows:

(The dates following the names indicate years of service in House or year or years in which officers held official positions.)

Lemuel P. Adams, California, 1925.  
Floyd J. Atwell, New York, 1937-1938.  
William C. Braisted, U. S. Navy, President-Elect 1919-1920; President 1920-1921.  
Roger Brooke, U. S. Army, 1938.  
Bertram L. Bryant, Maine, 1920-1923; 1925-1928; 1930-1933.  
Joseph T. Buxton, Virginia, 1920; 1922; 1924.  
Willis C. Campbell, Memphis, Tenn.; Section on Orthopedic Surgery 1939.  
Guy S. Carpenter, New York, 1940.

E. E. Cornwall, New York, 1911-1912.  
Walter F. Enfield, Pennsylvania, 1923.  
William L. Estes, Pennsylvania, 1909.  
Louis Frank, Kentucky, 1918.  
E. J. Goodwin, Missouri, 1909-1918; 1925-1934.  
C. A. Gray, Texas, 1928.  
William W. Harper, Alabama, 1928.  
Willis F. Hart, Maine, 1918.  
John A. Hatchett, Oklahoma, 1905-1906. Second Vice President 1908.  
Austin A. Hayden, Chicago. Treasurer 1922-1933; Trustee 1933-July 10, 1940.  
Emory Hill, Virginia, 1924; Section on Ophthalmology 1934-1936.  
Edgar A. Hines, South Carolina, 1910-1928; 1930-1940.  
Charles R. Hume, Oklahoma, 1918-1919.  
Charles E. Humiston, Illinois, 1915-1916; 1918-1919; 1921-1935 Special Session. Member Council on Medical Education and Hospitals 1930-1937.  
R. D. Kennedy, Arizona, 1928-1929.  
Hermann J. G. Koobs, South Dakota, 1919.  
Le Roy Long, Indian Territory, 1903-1904; Oklahoma, 1920.  
John J. McGovern, Wisconsin, 1913-1914.  
F. Clifton Moor, Florida, 1934.  
Fred Moore, Iowa, 1927; 1931-1940. Member of Council on Medical Education and Hospitals 1934-April 8, 1941.  
Arthur C. Morgan, Pennsylvania, 1911; 1929-1938.  
John P. Munroe, North Carolina, 1915.  
Oliver T. Osborne, New Haven, Conn., Section on Materia Medica, Pharmacy and Therapeutics 1902-1903; Section on Pharmacology and Therapeutics 1908.  
Ira N. Pickett, Nebraska, 1905-1906.  
William Allen Pusey, Chicago, Section on Dermatology 1910; 1914. Treasurer 1911-1922. President-Elect 1923-1924; President 1924-1925. Illinois delegate 1926-1932.  
Charles B. Reed, Illinois, 1933-1940.  
Charles Richard, U. S. Army, 1907; 1914.  
Andrew F. Richards, Tennessee, 1917-1918.  
Stewart R. Roberts, Georgia, 1916-1920.  
Joseph W. Schereschewsky, U. S. Public Health Service, 1918-1922.  
Alfred J. Scott Jr., California, 1934; 1936.  
Arthur C. Scott, Texas, 1911; 1924-1927.  
Harry C. Sharp, Indiana, 1909.  
Dudley Smith, California, 1927-1930; 1932.  
Elsworth S. Smith, Missouri, 1920.  
Richard R. Smith, Michigan, 1911-1912.  
Howard L. Snyder, Kansas, 1936-1940.  
John G. South, Kentucky, 1920-1921.  
Thomas S. Southworth, New York, Section on Diseases of Children 1907.  
C. E. Stackhouse, North Dakota, 1935 Special Session.  
Charles Stover, New York, 1908; 1910.  
Magnus A. Tate, Ohio, 1923; 1925-1928.  
Samuel J. Waterworth, Pennsylvania, 1917; 1926; 1928.  
Horace G. Wetherell, Colorado, 1910; 1912. Section on Obstetrics and Gynecology 1917-1918.  
Charles J. Whalen, Illinois, 1915-1918; 1920-1940.  
Carl Lewis Wheeler, Kentucky, 1913; 1916-1919. Section on Urology 1922.  
William V. Whitmore, Arizona, 1910.  
William N. Wishard, Indiana, 1902-1910. First Vice President 1918.  
Thomas A. Woodruff, Chicago. Section on Ophthalmology 1909-1910; 1913. Third Vice President 1908.

As was so well said of another who died, as they did on the field of duty, we can truthfully say of each of our departed associates and friends:

When a star is quenched on high,  
For ages will its light  
Still travel downward from the sky,  
Shine on our mortal sight.  
So, when a good man dies,  
For years beyond our ken  
The light he leaves behind him lies  
Upon the path of men.

On motion, duly seconded and carried, the delegates arose and stood in silent tribute to the memory of the deceased delegates and officers.

### Reference Committees

The Speaker announced the personnel of the Reference Committees. Included in the list which follows is the personnel of a Reference Committee on Military Preparedness, the appointment of which was later authorized by the House:

### SECTIONS AND SECTION WORK

George W. Kosmak, Chairman.....New York  
David D. Seannell.....Massachusetts  
Hilton S. Read.....New Jersey  
Rollo K. Packard.....Illinois  
B. J. Hein.....Ohio

### RULES AND ORDER OF BUSINESS

Thomas F. Thornton, Chairman.....Iowa  
Floyd S. Winslow.....New York  
James Q. Graves.....Louisiana  
Joseph F. Smith.....Wisconsin  
E. N. Roberts.....Idaho



## MEDICAL EDUCATION

Walter G. Phippen, Chairman.....	Massachusetts
Elbridge J. Best.....	California
Carl R. Steinke.....	Ohio
Louis A. Buie.....	Section on Gastro-Enterology and Proctology
Wingate M. Johnson.....	North Carolina

## LEGISLATION AND PUBLIC RELATIONS

Henry A. Luce, Chairman.....	Michigan
F. J. Pinkerton.....	Hawaii
John H. Fitzgibbon.....	Oregon
Terry M. Townsend.....	New York
F. S. Crockett.....	Indiana

## HYGIENE AND PUBLIC HEALTH

Arthur T. McCormack, Chairman.....	Kentucky
Warren F. Draper.....	U. S. Public Health Service
Lewis B. Bates.....	Isthmian Canal Zone
L. W. Larson.....	Section on Pathology and Physiology
William D. Johnson.....	New York

## AMENDMENTS TO CONSTITUTION AND BY-LAWS

William Weston, Chairman.....	Section on Pediatrics
Edward M. Pallette.....	California
Edmund R. Brush.....	Ohio
J. N. Baker.....	Alabama
Walter W. King.....	Colorado

## REPORTS OF OFFICERS

C. W. Roberts, Chairman.....	Georgia
H. G. Hamer.....	Indiana
L. G. Christian.....	Michigan
A. R. McComas.....	Missouri
Walter B. Martin.....	Virginia

## REPORTS OF BOARD OF TRUSTEES AND SECRETARY

Francis F. Borzell, Chairman.....	Pennsylvania
F. J. Savage.....	Minnesota
Robert A. Peers.....	California
William R. Brooksher.....	Arkansas
Meredith Mallory.....	Florida

## CREDENTIALS

G. Henry Mundt, Chairman.....	Illinois
Arthur J. Bedell.....	Section on Ophthalmology
Raymond L. Zech.....	Washington
J. Newton Hunsberger.....	Pennsylvania
A. P. Nachtwey.....	North Dakota

## MISCELLANEOUS BUSINESS

Charles G. Strickland, Chairman.....	Pennsylvania
Frederic E. Sondern.....	New York
Holman Taylor.....	Texas
Charles E. Kiely.....	Ohio
Andrew F. McBride.....	New Jersey

## EXECUTIVE SESSION

Thomas A. McGoldrick, Chairman.....	New York
Charles H. Henninger.....	Pennsylvania
Deering G. Smith.....	New Hampshire
E. S. Hamilton.....	Illinois
Guy W. Wells.....	Rhode Island
E. G. Wood.....	Tennessee
James R. Miller.....	Connecticut

## MILITARY PREPAREDNESS

Harvey B. Stone, Chairman.....	Maryland
James E. Paulfin.....	Section on Practice of Medicine
Sam E. Thompson.....	Texas
John H. O'Shea.....	Washington
Samuel J. Kopetzky.....	New York
E. H. Skinner.....	Section on Radiology
Joseph F. Smith.....	Wisconsin

## SERGEANTS AT ARMS

A. A. Ross.....	Texas
Frank E. Reeder.....	Michigan
John Z. Brown Sr.....	Utah

## Address of President Nathan B. Van Eitten

The Speaker resumed the chair and presented the President, Dr. Nathan B. Van Eitten, New York, who delivered the following address, which was referred to the Reference Committee on Reports of Officers:

*Mr. Speaker and Members of the House of Delegates:*

It is impossible to suppress an emotional regret that this is my valedictory. Although my bones are old, my spirit is still inquisitive. Fifty years of medical practice during a period of almost incredible scientific revelations stimulates a longing to see the unpredictables of the next half century. As the curtain is partly lifted on scenes of new therapy, of new developments in immunology, of new and daring surgery, of new social science, of new adventures into the mysteries of human behavior, of inevitable readjustment of world geography, one can neither

fold one's hands and close one's eyes in complacent retrospection nor suppress resurgent anxiety over our immediate social future.

## PROGRESS IN MEDICINE

The American Medical Association has attained the dignity of age as it has grown from a small group of founders in 1846 to its present stature of one hundred and eighteen thousand members. Ninety-five years of progress present an inspiring panorama. The triumphs of optimism, the evolution of science, the insistence on the highest possible qualification of the doctor of medicine, the romance of the physician as he progressed from empiricism to scientific controls and from the saddle bag to the automobile stimulate dreams of wonder as to whether the century ahead can be as remarkable as the century just past.

One must credit the founders of 1846 with being just as up to date as you are in 1941 as you view with amazement new discoveries which may completely change your conception of medical practice. Postgraduate education has as great importance for the physician of 1941 as it had for his predecessor of 1846. Unless the physician of 1941 is alive to the unfolding medical and surgical drama, he will find himself so far behind the procession that he will be unable to keep step with a public which is trying to understand the sensational revelations which are broadcast in the daily press.

I am profoundly grateful to the House of Delegates of the American Medical Association for many opportunities to share the responsibility of forming some of the policies of American medicine these many years and for selecting me as an official messenger to all American physicians two years ago. These are the greatest privileges that can be given to any American physician. In this room in 1934, as chairman of a reference committee, I had the honor to present for your approval a ten point program which seems to have stood the test of the last seven turbulent years. It has survived severe criticism especially directed at one of its essentials, "free choice of physician." Some self-esteemed persons have admitted that freedom to choose a doctor was quite right for themselves as they carried their arthritis to Philadelphia or Boston, their surgery to outstanding operators and their eyes to the best ophthalmologists. Their denial of the value of free choice applies only to other less fortunate persons. Mass medicine is wonderful for everybody except themselves. They would prescribe but cannot swallow their own medicine.

In 1939 you formulated an eight point platform which stems from the program of 1934. The essence of this platform is centralization of national health functions and decentralization of individual sickness under local control. The platform has had wide approval and at the present moment Washington health bureaus are operating under the coordinating directions of the Federal Security Administrator. This is perhaps the logical manner of correcting a multiplication of health functions distributed through many agencies in many government departments and may be the answer to the prayer of the Delegates of 1875, which was reaffirmed in 1939, even though it required a world convulsion to accomplish it.

This matter has been discussed freely during the past two years, and a bill to create a National Department of Health was introduced in the House of Representatives by Mr. Pfeiffer of New York in 1939. This bill was referred to the Committee on Administration Expenditures and died there. It was reintroduced in 1941. The Federal Security Administrator has strongly advocated the establishment of a National Health Department to be headed by an officer of Cabinet rank. Other statesmen have expressed favoring opinions. I commend this matter to your careful and appropriate action. A National Health Department is now functioning—without the title and without its director in the cabinet of the President. I trust that the national emergency will at least result in the permanence of this new government reorganization. It is a safe prediction, however, that this new alignment of Washington bureaus will be violently opposed by officials who will fear loss of place or prestige. If this House continues to favor the establishment of a National Health Department, it must continue to fight for it.

#### CENTRALIZATION OF GOVERNMENT HEALTH FUNCTIONS

I am in complete disagreement with those who claim that centralizing what are now government health functions means more state medicine. In a federation of forty-eight states certain blanket powers such as those needed to protect state lines in the instance of the dangers of spreading communicable disease would be most desirably concentrated in a single agency. The migrating indigent as he moves from state to state carrying his diseases along with his poverty presents health problems that cannot be controlled successfully by state governments. The protection of all our frontiers from invasion by those who may bring physical or moral or mental disease and become public menaces and public charges cannot be the responsibility of state government.

The Veterans Health Administration, which will inevitably expand to vast proportions, must be a national problem; it is really state medicine and should be. On the other side of the question, your platform of 1939 recognizes that individual sickness cannot wait for the state capitol or Washington to diagnose, segregate or prescribe; it must be treated on the spot, when it is discovered, in the smallest political subdivisions and controlled by the local medical profession.

#### POLICIES OF THE AMERICAN MEDICAL ASSOCIATION

The American Medical Association has been subjected to attack by certain groups with special interests as a selfish, reactionary, antisocial and restraining influence, opposing the activities of those who desire to practice group or cooperative medicine or any new plans for the delivery of medical care; it is accused of indifference and inertia in its attitude toward public health agencies. The language of these attacks declares, in the words of a New York newspaper of Tuesday, May 6, 1941, that the American Medical Association believes "that everything is right as rain" concerning the health of the underprivileged or the indigent or the unfortunate who cannot afford to pay for any medical care. This descent from the truth to mud slinging in order to illuminate an inspired article is interesting to you members of the House because you know that the American Medical Association, whose policies you form, desires for the American people only the best service for their best interests and their protection from any form of quackery which would exploit them when they are sick, and favors public health measures under proper auspices which can be used to keep them well and prevent infection regardless of race, creed, class or financial competence. The same article colors its argument with arraignment of "the old guard of organized medicine" or "the top clique of the American Medical Association" or the "American Medical Association hierarchs." This should interest you members of the House of Delegates for the reason that if there is such a thing as "the old guard of Organized Medicine" you compose it. If there is such a thing as "the top clique of the American Medical Association" you are it. If there are "American Medical Association hierarchs" you are they.

The old idle talk about a small group of persons in Chicago, or sometimes one person, as dictating the policy of the American Medical Association still goes on. If there are any dictators in American medicine you are, because you alone are responsible for making our policies. Your elected officers are merely your executives.

Why do otherwise intelligent persons and some physicians continue to believe these old stories? I have heard them for more than twenty-five years. In some manner we must be failing to present a clear and convincing picture of our organization. Can you not take the trouble to convince the people who sent you here and whose interest you serve that this is the most democratic of all democratic organizations? Can you not tell them that no one else delegated you to sit in this House and endowed you with power but the members of your county medical societies who sent you to your state societies, from which you were chosen for your high office? Can you not take the trouble to enlighten public opinion at your homes through your local newspapers and develop a consciousness of the realities of local health needs and promote them? Can you not tell the world that the loyalties of organized medicine are even more altruistic today than they have ever been before?

I have sat with your Trustees for eight years and I have observed the meticulous and exhausting patience with which they try in every way to carry out the spirit and the letter of the authorized actions of this House. Your Trustees handle your affairs without personal bias. They come from all regions of the country at great personal sacrifice, some of them every month, to concentrate their best intelligence on the execution of your decisions. Only one of them, Dr. Irons, lives in Chicago. Dr. West, Dr. Fishbein and Mr. Braun are executives. I have never heard or seen any of them attempt to originate any policy of the American Medical Association. I have heard these men called a "Triumvirate of Dictators." Mr. Braun could double your advertising if you would let him. Ethical advertising could yield to large volumes of uncensored advertising. Dr. Fishbein could travel in far more attractive financial fields than in those in which he is limited by his strict loyalty to the service of American medicine, to which he has dedicated his brilliant talents. Dr. West has been called a "Pooh-Bah" by some loose thinking space writers, possibly because he has been inflexible in his devotion to the principles that have been evolved in this house. He has frankly and forcibly expressed his convictions on many occasions, but he has never dictated policy.

Authors whose mental processes seem to have been influenced by Moscow or Berlin have written volumes of destructive criticism concerning the policies of the American Medical Association and the personalities of your executives. If these strictures on these characters who are so vital to the success of your organization have gained any credit in your minds, you should bring your doubts or your questions before the House for appropriate action. If you deny the truth of these allegations, you should at this time express your high appreciation of their unselfish devotion.

#### THE COMMITTEE ON MEDICAL PREPAREDNESS

At your session in New York last June the government of the United States made a formal request for help in the mobilization of medical personnel for national defense and you authorized the Speaker to appoint a nationwide Committee on Medical Preparedness. This committee has been at work for a year with a resulting mass of tabulated information that justified its existence and revealed that 95 per cent of American physicians are loyally willing to support the military services of the United States when and where they may be needed. This extraordinary record of patriotic expression strikes a high note of enthusiasm for the preservation of the integrity of our national existence and denies the claims of discord within the ranks of medicine which have been made by a few physicians, who have openly declared that our entire social structure must be leveled and rebuilt after the communistic manner. There can be no room in organized medicine for destructive ideologists if we are to continue to believe in the cohesive altruism which has survived the social revolutions of the centuries and which is now carrying us to still higher planes of public service. Our professional honor must never become a political football or be involved in interracial, interreligious or international battles that threaten our high position as a scientific and humane body. As Americans we must stand for whatever is best for America. As physicians we must stand for the best of mental, moral and physical health for all the world.

#### Address of President-Elect Frank H. Lahey

The Speaker presented the President-Elect, Dr. Frank H. Lahey, Boston, who delivered the following address, which was referred to the Reference Committee on Reports of Officers:

*Mr. Speaker and Members of the House of Delegates:*

As I see my responsibility in this address, it consists of calling your attention to things which have come to my mind while in the position of President-Elect, as I have been during the last year, and while interested and participating in the activities of the American Medical Association, as I have been for the past several years.

It has always interested me that an organization as large as the American Medical Association in terms of its membership, in terms of the number of people employed in it and in terms

of the income and expenditures involved in its conduct, and as broad and as varied as are, of necessity, its interests could be run as well as it is. It is additionally surprising that it functions as satisfactorily as it does—and we all admit that it functions very satisfactorily—in view of the fact that its destinies are controlled and directed by a group of men whose primary interest is scientific and who have, in addition, many unavoidable local responsibilities and, behind all of that, the need of raising and supporting families. Furthermore, it has always seemed to me that the American Medical Association has functioned surprisingly well when so much of the work must be done by paid representatives in extremely peculiar positions. They must direct really large affairs without final authority and without establishing a bureaucracy. They must please a vast majority but still maintain a large amount of independence of thought and action. In view of the peculiarity of this situation, it seems to me that the American Medical Association has been conducted very well. In the conduct of its affairs it has made mistakes, but they have been largely those of minor magnitude. No really gross mistake in the way of *policy or management* can truly be charged against this Association.

I have repeatedly thought as I have watched the functioning of the American Medical Association from within its executive circles that no one can possibly really evaluate what the American Medical Association has done for American medicine and, through that, for world medicine by its various activities without having lived intimately with the inner workings of the American Medical Association. For one to appreciate fully these values, the American Medical Association would really have to be destroyed and the country would have to exist without it over a period of time. The American Medical Association is undoubtedly not unlike a good wife—only fully appreciated when lost. We are all so adjusted to the aid, the resources and the helpful facilities of the Association that we tend, I believe, to make the mistake that is so often made by unappreciative husbands who think of their good wives much as they think of a comfortable piece of furniture. Not only does this thought, it seems to me, relate itself to those of us within medicine who benefit from its help and existence but, with even greater probability of the truth of the statement, by the lay public and by the government itself.

I have watched many of my friends pass through the occupancy of the position of President of the American Medical Association, and I have always promised myself that when the opportunity arose I would direct attention to the pressing need of protecting those men who occupy that position from the necessity of seriously affecting their health during that period. It is, I believe, extremely important not to place the responsibility of overconscientious fulfillment of the duties of this position on the shoulders of those who occupy it. They must of necessity always lean over backward in their desire to fulfil what they believe to be their obligations. They need your protection.

State societies, postgraduate meetings and local societies have properly, but naturally, one purpose; that is, to make their meetings the greatest possible success. They have no knowledge of the demands on the President's time and therefore no consideration for his health. They are conscious only of the immediate need for the success of their meeting. They have no knowledge or great interest in the number of engagements the President of the American Medical Association may have. Thus the tendency of the President, in his desire to satisfy every one, is to overdo.

There is therefore a need for assistance from the Association in publicizing to the state societies the necessity for the President of the American Medical Association to care for his health, and that this responsibility should not be entirely placed on the occupant of the position lest it be interpreted as a lack of willingness on his part to undertake all the obligations he should.

None of these suggestions have anything to do with me personally. I do not need the help, because I happen to be so constituted as to be able to decide for myself what is and what is not proper, and what I can and cannot do within reason. I happen also to be so independently situated that I can take

a position regarding obligations and stand on it. I am particularly impelled to speak of this because of the record as to the health of past presidents at the completion of their terms of office, because it has been so bad and because I wish to do something constructive for those who are to follow me.

I am probably as well able to handle this situation as almost any one, provided as I am with a large amount of clerical and professional help and with patients already well trained and adjusted to my frequent absence. Before occupying this position I had already become well immunized to travel, public addresses and a trouper-like existence. But even in the face of all this, when it is, as it is at times, difficult for me, I appreciate what it must be for a man practicing as an individual. It should not be necessary for a president of the American Medical Association to give up his practice. It should not be necessary to limit the selection of presidents of the American Medical Association to those who are giving up their activity in medicine and who are losing touch with active affairs. This is not what we should want. The men who are presidents of the American Medical Association should be men who are actively living with the live problems, not those who are tending to approach them from a sequestered and philosophic point of view.

While I am on this subject I should like to suggest that society meetings and nonprofessional groups may possibly be demanding too much of the time of some of our paid executives at headquarters in Chicago. It must likewise be a considerable tax on their nervous and physical energy, as has been stated in relation to the President. Must not those who occupy important executive positions at our headquarters be given the same consideration that presidents of the Association are given? With the demands for them at many meetings, may it not also become essential for them to decide whether or not the increasing burdens and responsibilities at headquarters necessitate their accepting less traveling and speaking engagements? May it not even be possible, as a suggestion, that the printed word, involving as it does the opportunity to measure carefully and evaluate its meaning before finally put into print, may be a more sound and safe way to publicize the activity of our society without the possibility of promotion of undesirable, critical reactions?

Probably few men have had a greater opportunity to interpret the reactions of the medical public throughout America than have I. I can truthfully say, and I am pleased to be able to state it to you, that the reactions of the medical public in America to the activities of the American Medical Association are with few exceptions extremely approving and appreciative. Having occupied various positions in the American Medical Association—as an officer of a section and as a member of the Council on Scientific Assembly and later of the Council on Medical Education and Hospitals—and having attended so many meetings in intimate contact with those giving so generously of their time to the conduct of these meetings, and at the same time sitting outside the circles of active participation in the House of Delegates and the other activities of the Association, I have been able to develop at this distance some ideas which I can at least mention to you. One that has occurred to me is the necessity of selecting young men as representatives in the House of Delegates of the American Medical Association and as members of various important committees of the House of Delegates. One of the greatest mistakes, it has always seemed to me, in the executive management of large affairs has been to put complete control into the hands of an older group of men and to fail to realize that there must be developed, by experience and by contact with problems, a constant supply of younger men. They secure from this experience the ability to take over the reins when the older men no longer are active. It has been my experience to see so many institutions, business and professional, come to a bad end through failure to appreciate this point. It will always be necessary for growing organizations to have fresh points of view as well as fresh, youthful representation, and to develop men interested in the organization side of medicine early in their careers.

With a full realization of the delicacy of the situation, yet with an equal realization of my responsibility to speak my mind as the representative of such a large body of men, and because I am so sincerely interested in seeing the American Medical

Association continue\* to occupy not only the place it does in American medicine but an even greater one, I am impelled to make the statement that is so outstandingly a conviction in my mind that it is extremely desirable that we be ever conscious of the fact that the Presidency of the American Medical Association should largely seek the man and not the man the position. Too much competition in the selection of men for President of the American Medical Association is injurious to it and, even more important, particularly injurious to the position that it does and must occupy in the minds of the American public.

It would be improper in an address to this group of men, who play such an important part in shaping and maintaining the policy of American medicine, if I were not to compliment the American Medical Association and other branches of medicine, such as the American College of Surgeons, the American Hospital Association and the specialty boards for their widening development of unselfish cooperation in the interests of better medicine now and for the future. We should all be conscious of the fact that what appeared to be in the beginning natural hostilities have been overcome in time. A better acquaintance of these groups with one another is constantly smoothing out difficulties which have in the past played a considerable part in slowing the progress of development and in preventing the accomplishment of changes of real advantage. The way has undoubtedly been cleared considerably by the elimination of personalities, which are natural and apparently inevitable, but which in the past generation undoubtedly have so hampered this progress which is so desirable.

I cannot close my remarks to this group without at least making a brief mention of the national situation. If we are frank with ourselves, and now certainly in this period it is desirable to be so, there are few of us who do not feel a sense of injustice regarding the attitude of the government toward organized medicine. I say this not in order in any way to be critical of government or of those who have to do with what a majority of us would consider injustices, but rather to plead that these are but trivial and possibly necessary features in our existence in these trying times. I mention them solely with the purpose to plead that they be not permitted to occupy any prominent position in our minds and to urge that we forget them and look toward the more urgent and important things at the present time, as I will state in my presidential address. Soon there will be made, and these remarks were written before it was made, a most important decision for this country and that is what is to be its position as relates to the world conflict. Suits, privileges, personalities, personal opinions in the light of that decision will, and should, occupy minor positions. The things that will need to be settled then will be: Can we subordinate our differences to the national need? Can we have that all important need in a conflict, national unity? Can we eliminate from our minds what we should like to have for what must be? That will be a real test of the democratic form of government. If we permit relatively unimportant trivialities to becloud our vision of this all important problem or if we permit personalities and personal differences to prevent us from giving wholehearted support to our country in this national emergency, we shall properly belong to that group so well described by Sir William Osler, who said "Only to the small is the trivial great."

## REPORTS OF OFFICERS

### Report of the Secretary

Dr. Olin West, Secretary, presented his report as printed in the Handbook, which was referred to the Reference Committee on Reports of Board of Trustees and Secretary.

### Report of Board of Trustees

Dr. Arthur W. Booth, Chairman, presented the report of the Board of Trustees as presented in the Handbook as well as the following supplementary report, which were referred to the Reference Committee on Reports of Board of Trustees and Secretary:

#### PAN AMERICAN RELATIONSHIPS

During the past year the Board of Trustees has had brought to its attention on several occasions the importance of the estab-

lishment of cordial relations and scientific interchange with our colleagues in South America, Central America, Cuba, Puerto Rico, Mexico and Canada. The Council on Scientific Assembly has had before it the question of arranging for suitable representation by these visitors on the scientific programs of the annual session. Several conferences have been held with the Coordinator for Pan American Affairs in Washington. The Board of Trustees has been impressed with the importance of facilitating further cooperation of this type in the interest of scientific advancement and unity of the American continents.

### Report of Treasurer

Dr. Herman L. Kretschmer, Treasurer, presented his report as printed in the Handbook, which was referred to the Reference Committee on Reports of Board of Trustees and Secretary.

### Report of Judicial Council

Dr. George Edward Follansbee, Chairman, presented the report of the Judicial Council as presented in the Handbook, as well as the following supplementary report, which were referred to the Reference Committee on Reports of Officers:

#### REVISION OF CONSTITUTION AND BY-LAWS AND OF PRINCIPLES OF MEDICAL ETHICS

Several items arising from the activities of the 1940 session of the House of Delegates, held in New York City, among them rewriting of the Principles of Medical Ethics and the revision of the Constitution and By-Laws with respect to membership and Associate Fellowship, have received the continuous attention of the Judicial Council during the past year. The Council is still of the opinion that the general state of the country and of the medical profession itself is so unsettled and confusing that no material change in either the Principles of Medical Ethics or the Constitution and By-Laws should be made until clarification of conditions takes place and more stability is established.

As instructed by the 1940 House of Delegates, the Judicial Council has devoted study to the proposal to consider representation of scientific sections in the House on a basis of their minimum registration at annual sessions.

The last reapportionment of delegates was made effective in 1941 and remains in effect through 1941, 1942 and 1943, at which time a new apportionment must be made for the 1944, 1945 and 1946 sessions of the House.

The Council believes that the number of angles involved in an equitable solution of this question justifies postponement of the Council's report on these matters until the 1942 session of the House of Delegates.

### Report of Council on Medical Education and Hospitals

Dr. Reginald Fitz, Acting Chairman of the Council, presented the Report of the Council on Medical Education and Hospitals as presented in the Handbook, together with the following supplementary report:

#### TRIBUTE TO DR. FRED MOORE

The members of the Council on Medical Education and Hospitals record with deep sorrow and regret the death of Dr. Fred Moore of Des Moines, Iowa, which occurred on April 8.

Dr. Moore was born in Harlan, Iowa, May 10, 1883; received the degree of M.S. from the University of California in 1907; studied medicine at Western Reserve University and at the State University of Iowa College of Medicine from 1907 to 1911, receiving the degree of doctor of medicine from the latter institution in 1911. He served an internship at the Montreal General Hospital and in 1914 engaged in further studies in Baltimore. Dr. Moore had been a practitioner in Iowa since 1911 and for many years limited his practice to pediatrics. He had an office in Des Moines since 1915. He was director of the health department of the public schools of Des Moines and was on the staffs of the Iowa Methodist, Iowa Lutheran and Mercy hospitals.

Dr. Moore was completing the last year of a seven year term as a member of the Council on Medical Education and

Hospitals. He showed great interest in the work of the Council and until his illness had a perfect record of attendance at its meetings. In his early years as a member he listened and learned and in a short time his high ideals, tempered by a sympathetic understanding, together with his determination to maintain high standards of medical education, were of inestimable value in the deliberations of the Council.

#### INTERN HEALTH

Two years ago the Trustees asked of the Council on Medical Education and Hospitals that a study be made of the health of interns. Such a study was begun at once. A report of the preliminary steps of the investigation was presented to the House of Delegates a year ago. Briefly, there appeared no evidence to suggest that the health of interns was notably bad; yet among sixty-one interns who during the three year period of 1937, 1938 and 1939 were compelled to discontinue work because of illness, tuberculosis was an important and significant factor. This disease occurred in thirty-six instances and thus caused 59 per cent of all the serious casualties.

During the past year the problem of intern health has been further investigated from a different angle. Letters were sent to five thousand three hundred and one physicians who received their medical diplomas from recognized schools in 1937. They were asked to give an account of their hospital experience and also of the nature of any illness suffered during it, with a line stating the amount of time lost from work. This method of studying the problem was adopted in the belief that doctors in general might be interested in a study of this nature, and that, as a typical group, men and women four years out of medical school would remember their own illnesses with sufficient vividness as to make the data obtained both interesting and accurate.

Two thousand eight hundred and forty replies to the questionnaire have been received, and in addition are the records in the files of the American Medical Association of thirty-four fatalities known to have occurred among the men who graduated in that year.

Hospital life creates no immunity to illness. The types of illnesses to which these particular interns and residents fell heir make a glossary of diagnostic terms, though naturally respiratory infections were the commonest single incapacitator.

The illnesses, on the whole, were not incapacitating for long periods of time and proved to be of little more than a minor nuisance. There were three diseases which were encountered so frequently as to make them seem of significant importance. These were appendicitis, pneumonia and tuberculosis. There were 142 cases of appendicitis, there were 103 cases of pneumonia and there were 48 cases of tuberculosis.

In light of present knowledge, the illnesses which interns and residents are likely to acquire are not often strictly preventable. Interns and residents, however, should be given proper living quarters, adequate recreational facilities, good food, happy surroundings and some form of systematized medical supervision in order to protect their health reasonably and thus enable them to accomplish more. There should be enough interns in each hospital so that no one intern is grossly overworked. A friendly interest on the part of older members of the staff in the amount of work each intern does and in his physical and mental adjustments to it may do much to prevent catastrophes.

The problem of tuberculosis is important enough to receive particular consideration. Each hospital should make a rule to require chest roentgenograms of its interns at six month intervals. Large hospitals dealing with vast numbers of patients should go even further. They should require their interns and residents to have chest films at three month intervals. If a rule of this sort was made general, tuberculosis in the resident staff would be recognized more quickly than it is at present and unnecessary loss of the time spent in treatment would be saved.

On the whole, the health of doctors living in hospitals appears to be an important matter and it deserves careful consideration.

#### ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR CLINICAL LABORATORY TECHNICIANS

PREPARED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS OF THE AMERICAN MEDICAL ASSOCIATION  
WITH THE COOPERATION OF THE AMERICAN SOCIETY OF CLINICAL PATHOLOGISTS

#### PREAMBLE

Two organizations are primarily concerned with the training of clinical laboratory technicians: the Council on Medical Education and Hospitals of the American Medical Association and the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists. The Council functions by inspecting, reporting and approving these schools, while the Board of Registry investigates and certifies the competence of the technicians.

The Council, with the cooperation of the Board of Registry, has promulgated standards for this type of training for the information of physicians, hospitals, prospective students and others and for the protection of the public.

Technicians are being trained in these schools to work under the direction of qualified physicians and not as independent practitioners of laboratory work.

#### I. ADMINISTRATION

1. Acceptable schools for training laboratory technicians may be conducted by general hospitals where the majority of the student's practical training is received. This arrangement should not discourage affiliations between the hospital and universities, colleges, public health laboratories or other hospitals.

2. Responsibility for the maintenance of the school should be placed on the hospital administrator rather than on the laboratory director.

3. Resources for continued operation of the school should be insured through regular budgets, gifts or endowments, but not entirely through students' fees. Experience has shown that commercial schools operated for profit frequently do not adhere to proper ethical and educational standards and therefore are not acceptable.

#### II. ORGANIZATION

1. Adequate space, light and modern equipment shall be provided in the laboratory department. A library containing up to date references, textbooks and scientific periodicals pertaining to clinical laboratory work and pathology should be maintained.

2. Satisfactory record systems shall be provided for all work carried on in the department. Monthly and annual classifications of the work of the department should be prepared.

3. Transcripts of high school and college credits and other credentials must be available. Records should be kept of each student's attendance and grades as well as the number and type of tests performed. In addition, a synopsis of the complete curriculum should be on file in the office of the laboratory director. This curriculum should include the rotation of assignments, the outline of instruction supplied by the laboratory and a list of the prepared specimens which are used to augment the experiences of the student.

4. At least two or more students should be enrolled in each class. Approval is automatically withdrawn if a school does not have any students for a period of two years, unless a satisfactory reason for this is given.

#### III. FACULTY

1. The school should have a competent teaching staff. The director must be a graduate in medicine who holds the certificate of the American Board of Pathology or who has had the equivalent in training and experience. He shall take part in and be responsible for the actual conduct of the training course. He shall be in daily attendance for sufficient time to supervise properly the laboratory work and teaching.

2. In laboratory practice the enrollment shall not exceed one student to each member of the teaching staff. The staff should include not less than one salaried instructor who is a registered technician or eligible for registration, in addition to the laboratory director. In order to be considered as an instructor, a



technician must have had three years of experience, while members of the hospital staff or visiting instructors must have regular assignments that cover a complete course prescribed in the Essentials.

#### IV. PREREQUISITES FOR ADMISSION

Candidates for admission should be able to satisfy one of the following requirements:

(a) Two years of college work, including chemistry and biology from an accredited college or university.

After Jan. 1, 1943 this requirement shall read two years of college work, including general chemistry, quantitative chemistry and biology from an accredited college or university. Bacteriology may be substituted for biology. Organic chemistry and physics are highly recommended.

(b) Graduation at a school of nursing recognized by the state board of nurse examiners and in addition college chemistry.

After Jan. 1, 1943 requirements for nurses shall include one year of college work, thirty semester hours (forty-five quarter hours), including courses in chemistry and biology.

#### V. CURRICULUM

1. The course of training shall be not less than twelve months in duration and shall include the following subjects: biochemistry, hematology, bacteriology, parasitology, histology and serology. The training shall also include a course in record keeping.

2. The instruction shall follow a planned outline similar to the Model Curriculum of the Board of Registry of Medical Technologists and shall be accomplished by text assignments, lectures or informal discussions, demonstrations, supervised practice, quizzes and written, oral and practical examinations.

#### VI. CLINICAL MATERIAL

Each student should receive practice training, adequate in kind and amount, under competent supervision, in a hospital laboratory. The hospital should be registered and be otherwise acceptable to the Council on Medical Education and Hospitals of the American Medical Association and have a minimum of two thousand yearly admissions. A sufficient amount of clinical material should be available to permit the student to comply with the requirements of the Board of Registry. If the hospital is not able to supply all of this material through its routine tests and examinations, artificial mediums should be provided.

#### VII. ETHICS

1. Exorbitant fees and commercial advertising shall be considered unethical.

2. Schools conducted primarily for the purpose of substituting students for paid technicians will not be considered for approval.

The report and the supplementary report of the Council were referred to the Reference Committee on Medical Education, with the exception of that part of the supplementary report dealing with intern health, which was referred to the Reference Committee on Hygiene and Public Health.

#### Report of Council on Scientific Assembly

Dr. James E. Paullin, Chairman, presented the report of the Council on Scientific Assembly as printed in the handbook, which was referred to the Reference Committee on Sections and Section Work.

#### Appointment of Reference Committee on Military Preparedness

On motion of Dr. Arthur J. Bcdell, Section on Ophthalmology, seconded by Drs. Arthur T. McCormack, Kentucky, and Burt R. Shurly, Section on Laryngology, Otology and Rhinology, and carried, the House authorized the appointment of a Reference Committee on Military Preparedness, on which the Speaker named members as follows: Harvey B. Stone, Chairman; James E. Paullin; Sam E. Thompson; John H. O'Shea; Samuel J. Kopetzky; Edward H. Skinner, and Joseph F. Smith.

#### Address of Dr. T. C. Routley

The Chairman presented to the House Dr. T. C. Routley, official representative of the Canadian Medical Association, who addressed the House as follows:

*Mr. Speaker, Mr. President, Mr. President-Elect, Ladies and Gentlemen:* Once again it is my privilege and pleasure to bring you greetings from your brother practitioners in the Dominion of Canada. I do so on this occasion not only for those who are with us in Canada but on behalf of perhaps fifteen hundred who are no longer within our borders but are serving in forces in other lands.

Since I had the privilege of speaking to you a year ago, we have seen the world become turbulent and confused. These are days, however, when at least one profession may be expected to endeavor to keep the world on an even keel. The medical profession as a scientific body marches on; it recognizes no geographic or international boundaries; it is a profession to which mankind can look and should look for leadership and guidance and sane living. It is my hope that the medical profession of all lands will find its true place in the days to come.

I would like, sir, to express on behalf of my organization our profound thanks for the presence at our annual meeting last year of Dr. Van Etten and Dr. Cullen, who came to us, who brought us greetings, and who added materially to the success of our meeting.

I should also like to express in anticipation of his coming a most cordial welcome to Dr. Braasch, who is to visit us on your behalf at the Winnipeg meeting, and may I say to those of you who find it convenient to be in Winnipeg during the last week of June, we shall open to you our hearts and our homes and make you as welcome as you have made me for these many years.

Mr. Chairman, I shall not detain you longer other than to say a final word. I want to thank you from the bottom of my heart, and I speak for all Canadians when I say this, because we know you are our good neighbor.

#### NEW BUSINESS

#### Resolution Requesting the Appointment of a Committee to Survey the Relationship of Medicine and Law

Dr. Walter G. Phippen, Massachusetts, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, Medical knowledge and skills have much to offer in investigations which seek to determine the cause of and the circumstances surrounding certain deaths; and

WHEREAS, The quasijudicial office of county coroner does not possess and is not qualified to exercise such knowledge and skills; and

WHEREAS, The failure to utilize such knowledge and skills seriously impairs the ends of justice; and

WHEREAS, The utilization of such knowledge and skills is essential to the public good; and

WHEREAS, The commonwealth of Massachusetts was the first community in the English speaking part of this continent to discard the archaic county coroner and substitute a system of county medical examiners; and

WHEREAS, The Massachusetts Medical Society was largely instrumental in bringing this about; be it therefore

*Resolved*, That (1) the Speaker of the House of Delegates of the American Medical Association shall appoint a committee of three, which committee shall be designated as this House of Delegates shall determine; (2) the committee so appointed shall survey the relationship of medicine and the law with particular reference to the manner in which this relationship is exercised in those counties which still cling to the coroner system; (3) the committee set up under this resolution shall be instructed to confer with such other committee or committees as are or will be designated by the American Bar Association, and (4) the committee created by this resolution shall make available to state medical societies all information gathered under these instructions.

#### Resolution Authorizing Establishment of a Health Exhibit for the Public at Cities Where Annual Sessions Are Held

Dr. William R. Molony Sr., California, presented the following resolution, which was referred to the Board of Trustees:

WHEREAS, The California Medical Association, recognizing the need of acquainting the general public with the problems of health and sound principles of medical practice, has established a policy of public health education; and

WHEREAS, Scientific exhibits constitute an effective means of acquainting the public with health problems as evidenced by the great public interest in the week-long Health Defense Exhibit in the Shrine Auditorium sponsored by the Los Angeles County Medical Association; and

WHEREAS, Such material is easily available at the time in each city in which the American Medical Association meeting is held and public interest has already been aroused by favorable newspaper publicity in relation to said convention; therefore be it

*Resolved*, That this House of Delegates of the American Medical Association authorize the Board of Trustees in its judgment to establish during the week immediately following the session a health exhibit for the public in each of the various cities in which the annual session of the American Medical Association is held and utilize such material from the Scientific Exhibit, to which other material may be added, which would be of interest and of educational value to the general public.

#### Proposed Amendment to By-Laws

Dr. O. P. J. Falk, Section on Pharmacology and Therapeutics, presented the following proposed amendment to the By-Laws, which was referred to the Reference Committee on Amendments to the Constitution and By-Laws:

The Council on Scientific Assembly at its meeting held in Chicago last December endorsed the proposal that the name of the Section on Pharmacology and Therapeutics be changed to the Section on Experimental Medicine and Therapeutics. This recommendation has been included in the report of the Council on Scientific Assembly made to the House of Delegates at this session.

The Section on Pharmacology and Therapeutics therefore requests that chapter XV, section 1 be amended so that item 7 in that section shall read "7. Experimental Medicine and Therapeutics."

#### Resolution Requesting Appointment of Committee to Study Question of Determination of Serum Sensitivity

Dr. Walter W. Mott, New York, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, On the occasion of a train wreck at Little Falls, N. Y., in April 1940 a number of the injured were brought in unconscious; and

WHEREAS, In making tests to determine serum sensitivity before administering tetanus antitoxin 2 cases were found; and

WHEREAS, It has been suggested that a tattoo code or other means of identification showing serum sensitivity might be devised to safeguard unconscious accident patients; and

WHEREAS, The Medical Society of the State of New York considers the subject deserving of national consideration; therefore be it

*Resolved*, That a committee of the American Medical Association study this question and report to this House in 1942.

#### Resolution Requesting Appointment of Committee to Confer with Specialty Boards

Dr. L. G. Christian, Michigan, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

Report of the Committee on Distribution of Medical Care Presented to the Michigan State Medical Society House of Delegates, Sept. 24, 1940:

Arising out of the discussion of the report of the committee on distribution of medical care, the following points seem clear:

1. It is recognized that not all qualified physicians have been certified by a specialty board.

2. It is also recognized that the opportunities for formal academic preparation for certification by these boards are very limited, and, further, that the value of experience has not always been given adequate consideration.

To correct the above mentioned faults in the existing situation, the reference committee offers the following resolution, which was adopted by the house of delegates of the Michigan State Medical Society:

WHEREAS, Now as never before, this country needs the concerted effort and wholehearted cooperation of American physicians; and

WHEREAS, Certification by specialty boards is being arbitrarily taken by government agencies as an imperative requirement for performance of many medical services paid for by government funds; and

WHEREAS, Such work is increasing in amount and importance; and

WHEREAS, This policy works a hardship on many qualified physicians by excluding them from such work; therefore be it

*Resolved*, That the Michigan delegates to the American Medical Association be instructed to propose to the House of Delegates of the American Medical Association that a committee of that House be created to confer with specialty boards, national organizations of specialists and government agencies to effect some equitable adjustment of these difficulties and remove this potential source of dissension in the ranks of American medicine.

#### Resolution on Eligibility of Women Physicians and Surgeons for Medical Reserve Corps

Dr. Emily D. Barringer, New York, presented the following resolution, which was referred to the Reference Committee on Military Preparedness:

WHEREAS, The United States of America is at present engaged in a vast preparedness program which includes a listing of members in the Medical Reserve Corps available for active service; and

WHEREAS, There are approximately eight thousand women physicians and surgeons in the United States, and women physicians and surgeons of America demonstrated their fitness for wartime service during the first World War when they financed units and staffed hospitals with well trained officers, in France and Serbia; and

WHEREAS, The United States government has to date taken no cognizance of these women physicians in time of national emergency; and

WHEREAS, The government has already granted women nurses Army rating with proper rank, pay, and war risk insurance; and

WHEREAS, The Medical Society of the State of New York has gone on record recommending that the women physicians and surgeons of America be made eligible for the Medical Reserve Corps of the United States Army and Navy and be granted full privileges thereof; therefore be it

*Resolved*, That the American Medical Association go on record to this effect and that a request go to the Surgeon Generals of the Army and Navy to make women physicians and surgeons of the United States eligible for the Medical Reserve Corps of Army and Navy with full privileges thereof.

#### Resolutions on Specialists

Dr. Thomas A. McGoldrick, New York, presented the following resolutions, which were referred to the Reference Committee on Medical Education:

WHEREAS, At the regular meeting of the Kings County Medical Society held March 19, 1940 the following resolution was introduced and passed unanimously; be it

*Resolved*, That in order to serve better the hospitals with which they are connected and to improve that service by greater cooperation and understanding, the Joint Council of Pathologists, Radiologists, Anesthesiologists and Physical Therapy Physicians recommends that all hospitals approved for medical training for interns shall have physicians especially trained in pathology, radiology, anesthesiology and physical medicine in charge of these respective departments and that the directors of these departments shall be members of their respective medical boards or their equivalent, with voice and vote; and

WHEREAS, At the meeting of the Kings County Medical Society the delegates to the Medical Society of the State of New York were instructed to present and support the foregoing resolution; therefore be it

*Resolved*, That in those communities in which the aforementioned specialties are not represented by specialists it shall be permissible for physicians trained in these specialties to represent the specialty on their respective medical boards or their equivalents; and be it

*Resolved*, That the house of delegates of the Medical Society of the State of New York at its regular session of May 6, 1940 does hereby approve this resolution; and be it further

*Resolved*, That this resolution be presented to the House of Delegates of the American Medical Association at its next meeting in New York City, in June 1940.

#### Resolutions Requesting Appointment of Committee to Confer with Committees of Hospital Associations

Dr. Harry H. Wilson, California, presented the following resolutions, which were referred to the Reference Committee on Legislation and Public Relations:

WHEREAS, In the drafting of policies or contracts to cover medical and hospitalization services of nonprofit and other prepayment organizations it is of primary importance that the agreements or contracts shall make a clear differentiation of medical and hospitalization services that will permit physicians who give pathologic laboratory, x-ray laboratory, anesthesia or similar services, to maintain their physician-patient relationship and their own status as physician specialists; and

WHEREAS, In many plans designed to promote more adequate service among lower income groups of citizens it has seemingly been difficult to maintain the necessary professional distinctions concerning such medical work, and the ways and means whereby compensation shall be made therefor; now therefore be it

*Resolved*, That the California Medical Association through its constituted authorities herewith requests the House of Delegates of the American Medical Association to instruct the Board of Trustees of the American Medical Association to appoint a committee of such number as may be deemed advisable to confer with similar committees representing the American Hospital Association and the Catholic Hospital Association of the United States, the conjoint committees to study and submit reports to their respective national bodies, in which would be outlined platforms or principles designed to clarify the relation of medical services that may be offered in prepayment hospitalization and similar plans, the same to be in line with the basic principles laid down in the past by the House of Delegates and other authorities of the American Medical Association; and be it further

*Resolved*, That the Board of Trustees be requested to proceed in these matters as expeditiously as may be possible, and to submit the com-

mittee's report, with such suggestions and/or recommendation that the Board of Trustees may wish to attach thereto, at the next annual session of the American Medical Association, the Board of Trustees to be authorized in the interim to advise the constituent state associations of the American Medical Association concerning tentative or other agreements that may have been reached.

Resolution Requesting the Creation of a Section  
on General Practice

Dr. Henry A. Luce, Michigan, presented the following resolution, which was referred to the Reference Committee on Sections and Section Work:

WHEREAS, Sixty-six and two-thirds per cent of the doctors of medicine of this nation are general practitioners, and these general practitioners constitute the bulk of the membership of the American Medical Association; and

WHEREAS, General practice is an entity of and by itself within the profession, is definite in its comprehension and is limitless in its extension; and

WHEREAS, The organized specialty groups have set up certain restrictive rules and regulations concerning important portions of the field of general practice, which rules and regulations cannot be met and surmounted in the aggregate by the physicians who are making general practice their life work; and

WHEREAS, Forty per cent of surgery and 50 per cent of obstetrics are efficiently performed by well trained general practitioners; and

WHEREAS, Efforts to date looking toward the creation of an official section of general practitioners in the American Medical Association have met with disapproval and no sufficiently good reasons have been advanced for denying the general practitioners this vital means by which they can help themselves to face and solve their own particular problems; and

WHEREAS, General practitioners are constantly engaged in continuation study to increase their proficiency along practical lines and are developing more suitable programs of clinical study, as is evidenced by statistics from one section of the country which shows that 60 per cent of those in attendance at postgraduate courses are general practitioners; and

WHEREAS, No place has been provided on hospital staffs through which general practitioners would be enabled to submit their evidence of special training in certain fields of medicine and surgery which would qualify them before the public as proficient therein; and

WHEREAS, General practitioners have a special interest in medical legislation, administration and jurisprudence which justifies their particular voice being officially heard; and

WHEREAS, It is not the desire of the general practitioner to disrupt the splendid variety and caliber of scientific programs of the American Medical Association but rather to create a new and proper basis for separate registration, representation and participation in the general activities of the organization; and

WHEREAS, The general practitioners have original contact with the great majority of all patients; and

WHEREAS, The people of the United States will be inclined to view with favor and good will the official recognition of their family physicians as a distinct part of the American Medical Association; and

WHEREAS, The specialty fields are overcrowded with general practitioners classified as specialists only because there is no proper classification for them; and

WHEREAS, The establishment of an official Section on General Practice in the American Medical Association will stimulate a more active interest and cooperative attitude among the profession generally, making for greater unity in the advancement of the organization's programs; and

WHEREAS, The Council of the Wayne County (Mich.) Medical Society has gone on record as endorsing the introduction of this resolution for the creation of a Section on General Practice of the American Medical Association; and

WHEREAS, The Michigan State Medical Society has approved the introduction of resolutions at this meeting looking toward the expansion of hospital staff privileges for general practitioners throughout the country; therefore be it

Resolved, That the House of Delegates of the American Medical Association take whatever action is proper at this time to create as soon as possible a new Section on General Practice to be duly constituted of equal rank and authority with the other sections already established.

Resolution on Hospital Privileges for General  
Practitioners

Dr. C. R. Keyport, Michigan, presented a resolution dealing with hospital privileges for general practitioners, which was referred to the Reference Committee on Miscellaneous Business.

Resolution on Continuation of Supply of Well  
Trained Medical Graduates

Dr. Louis H. Bauer, New York, presented a resolution concerning the deferment of medical students, which was read by title and referred to the Reference Committee on Military Preparedness.

Communication Concerning Uncompensated Services  
Rendered by Physicians to the Selective Service

Dr. Edward E. Barlow, Arkansas, presented by title a communication concerning uncompensated services rendered by physicians to the Selective Service, which was referred to the Reference Committee on Military Preparedness.

Resolution on Medical Examination of Draftees

Dr. T. K. Gruber, Michigan, presented by title a resolution on Medical Examination of Draftees, which was referred to the Reference Committee on Military Preparedness.

Resolution on Patriotic Services of Native American  
and Foreign Born Physicians

Dr. Samuel J. Kopetzky, New York, presented by title a resolution dealing with patriotic services of native born and foreign born physicians, which was referred to the Reference Committee on Military Preparedness.

The House recessed at 12:45 p. m. to reconvene at 9:30 a. m., Tuesday, June 3.

(To be continued)

REGISTRATION AT CLEVELAND

The total registration at Cleveland was 7,269. Below are summaries of the registration by sections and by states:

Registration by Sections	
Practice of Medicine.....	2,440
Surgery, General and Abdominal.....	1,147
Obstetrics and Gynecology.....	432
Ophthalmology.....	281
Laryngology, Otology and Rhinology.....	257
Pediatrics.....	277
Pharmacology and Therapeutics.....	55
Pathology and Physiology.....	315
Nervous and Mental Diseases.....	182
Dermatology and Syphilology.....	191
Preventive and Industrial Medicine and Public Health.....	187
Urology.....	195
Orthopedic Surgery.....	225
Gastro-Enterology and Proctology.....	243
Radiology.....	236
Anesthesiology.....	127
Two or more sections or no sections marked.....	458
Miscellaneous Topics.....	21
Total.....	7,269

Registration by States			
Alabama .....	33	Nevada .....	2
Arizona .....	17	New Hampshire .....	13
Arkansas .....	19	New Jersey .....	94
California .....	204	New Mexico .....	2
Colorado .....	49	New York .....	713
Connecticut .....	59	North Carolina .....	46
Delaware .....	12	North Dakota .....	7
District of Columbia .....	91	Ohio .....	2,372
Florida .....	57	Oklahoma .....	37
Georgia .....	42	Oregon .....	24
Idaho .....	5	Pennsylvania .....	646
Illinois .....	568	Rhode Island .....	18
Indiana .....	217	South Carolina .....	25
Iowa .....	73	South Dakota .....	3
Kansas .....	47	Tennessee .....	59
Kentucky .....	87	Texas .....	106
Louisiana .....	46	Utah .....	17
Maine .....	19	Vermont .....	8
Maryland .....	73	Virginia .....	66
Massachusetts .....	149	Washington .....	35
Michigan .....	412	West Virginia .....	97
Minnesota .....	117	Wisconsin .....	130
Mississippi .....	14	Wyoming .....	2
Missouri .....	149	Canada .....	35
Montana .....	12	Miscellaneous .....	41
Nebraska .....	67	Total .....	7,269

## MEDICAL LEGISLATION

### STATE MEDICAL LEGISLATION

#### Florida

*Bills Introduced.*—H. 1626 proposes to establish in Dade County the office of county medical examiner. The county medical examiner must be a graduate of some recognized school of medicine and surgery and licensed to practice in the state. It is proposed to confer on the county medical examiner the authority and duties generally conferred in other states on coroners. H. 1636 proposes to establish the office of county medical examiner in all counties having a population of more than 267,000. The jurisdiction proposed to be conferred on the county medical examiner in such counties is similar to the jurisdiction proposed in H. 1626.

*Bill Passed.*—H. 1556 passed the House, May 27, proposing to establish a public hospital district in Broward County to provide free of cost necessary hospital care and medical treatment to indigent residents of the county. Such care and treatment may be rendered to persons who are not paupers for a reasonable compensation for occupancy, nursing, care, medicine and attendance, according to the rules and regulations to be prescribed by the board of trustees of the hospital district.

#### Illinois

*Bills Introduced.*—S. 641 proposes to prohibit the retail sale and distribution of barbital except on the written prescription of a licensed physician, dentist or veterinarian. The bill states that "Barbital" includes diethyl-barbituric acid, barbital sodium, and all compounds containing barbital, barbituric acid, barbital sodium, or any derivative of any of them, whether in crystalline, liquid, or other form, which are, or may be used internally as pain-killers, soporifics, or for other purposes." H. 910 proposes to authorize the Department of Public Health, through its Division of Cancer Control, to formulate policies, establish standards and regulations, prescribe schedules and terms of payment, and specify the conditions under which indigent cancer patients may be provided with care and treatment at governmental expense. The bill proposes to authorize the department to acquire such equipment and other materials and to hire such personnel as may be necessary to carry out the purpose of the bill. The bill proposes to appropriate \$200,000 to the department for these purposes. H. 911 proposes to create a Committee to Investigate Chronic Diseases among indigents to make a thorough survey of the number of persons in indigent circumstances in the state afflicted with chronic diseases who are not already provided for in existing state institutions and to submit recommendations to the sixty-third general assembly, when it convenes, accompanying the recommendations with appropriate legislative proposals to provide for the construction, equipment and operation of such institution or institutions as the committee may determine to be necessary.

### DISTRICT OF COLUMBIA

*Bill Introduced.*—S. 1593, introduced by Senator McCarran, Nevada, provides that certain buildings and grounds of hospitals in the District of Columbia and occupied and used by the hospitals for legitimate hospital purposes shall be exempt from all national and municipal taxation.

### MEDICAL BILLS IN CONGRESS

*Changes in Status.*—H. R. 4926 has passed the House, making appropriations for the Department of Labor, the Federal Security Agency and related independent agencies, for the fiscal year ending June 30, 1942. This bill, among other things, authorizes an appropriation of \$1,235,000 to enable the United States Public Health Service to assist state and local health authorities in health and sanitation activities (1) in areas adjoining military and naval reservations, (2) in areas where there are concentrations of military and naval forces, (3) in areas adjoining government and private industrial plants engaged in defense work and (4) in private industrial plants engaged in defense work. This appropriation, too, may be utilized to provide emergency health and sanitation services in government industrial plants engaged in defense work and in areas adjoining United States military and naval reservations outside of the United States. The bill furthermore appropriates \$1,200,000 to be utilized by the United States Public Health Service for the cost, including subsistence but not cash allowances to trainees, of refresher, student nurse and postgraduate nursing courses, including courses in midwifery. H. R. 4965 has been passed by the House, making appropriations for the military establishment for the fiscal year ending June 30, 1942. As reported, this bill provided, among other things, for an appropriation for the employment of interns at not to exceed \$720 per annum each. On the floor of the House an amendment was adopted providing for the employment of interns, at \$720 per annum, who are graduates or have successfully completed at least four years' professional training in reputable schools of medicine or osteopathy. Another amendment appropriates "such additional sum as the Surgeon General [of the army] may determine to be necessary for assisting financially civilian schools on account of student nurses undergoing training therein for duty in army hospitals and for assisting such student nurses."

*Bill Introduced.*—S. 1546, introduced by Senator McNary, Oregon, relates to the production of poppies for seed purposes only. This bill provides that no person who produces opium poppies shall, by reason of the production of such poppies, be deemed for the purposes of any Act of Congress to be a producer of opium or any derivatives thereof, or of any other narcotic substance, if he complies with the regulations prescribed by the Secretary of Agriculture. The bill provides that the Secretary of Agriculture shall prescribe regulations (1) providing that any person who seeds land to opium poppies shall file with the Secretary, or his representative, at such time or times as may be fixed by such regulations, a report or reports showing the area and location of the land seeded by him to such poppies; (2) prohibiting the collection or extraction from such poppies of any opium, morphine or other narcotic substance; (3) providing for such utilization and disposition of every part of the poppy plants by the producer of any such poppies in such manner as will, in the opinion of the Secretary, prevent the extraction or collection of narcotic substances therefrom, and (4) providing that the producer of any such poppies shall make such reports, under oath, with respect to the utilization and disposition of every part of the poppy plants as may be required by the Secretary.

## WOMAN'S AUXILIARY

#### Indiana

On February 3 and 4 the regional meeting of the Women's Field Army for Cancer Control met in Indianapolis with the national auxiliary president, Mrs. V. E. Holcombe, of Charleston, W. Va., present. Accompanying her was Mrs. A. A. Seletz, also of Charleston, and the program chairman for the West Virginia state auxiliary. A luncheon in their honor was given February 3 in the Indianapolis Athletic Club.

The Woman's Auxiliary to the Indiana State Association has added a new group to its organization, La Porte County. This new auxiliary chose Mrs. F. M. Fargher, of Michigan City, as president.

The legislative committee provided the program for the Marion County auxiliary, January 6. Dr. Norman Beatty and Mr. Thomas A. Hendricks discussed medical legislation pending in the state legislature. Fifty-one members attended the meeting.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### CALIFORNIA

**Orchestral Society.**—Physicians and dentists have joined in organizing the Medical Arts Orchestral Society in Los Angeles. William R. Bergren of the California Institute of Technology, Pasadena, is the conductor, and rehearsals take place every Thursday night in the auditorium of the Cedars of Lebanon Hospital. Interested persons are requested to communicate with Dr. Fred Lindenberg, secretary of the society.

**Santa Monica Hospital Transferred.**—The Santa Monica Hospital, Santa Monica, will be turned over to the California Hospital, operated by the Lutheran Hospital Society of Southern California, Los Angeles, Jan. 1, 1942. The transfer will fulfil the plans of Dr. William S. Mortensen, president and medical superintendent of the Santa Monica Hospital, to convert his profit corporation into a nonprofit charitable institution for the citizens of Santa Monica. The gift includes the one hundred and fifty bed Santa Monica Hospital and adjoining property and the Loamshire Convalescent Home, with a capacity of thirty beds, and will serve to create a memorial to Dr. August B. Hromadka and Dr. Mortensen. The widow of Dr. Hromadka is participating in the transaction. The administration of the Santa Monica Hospital, which will be converted into a two hundred bed institution, will be carried out under a foundation, the creation of which is now being negotiated. The present medical staff will continue and the two hundred workers at the hospital will be retained.

### CONNECTICUT

**Yale Dedicates New Library Building.**—The dedication and opening of the new Yale Medical Library, New Haven, will take place June 15. The ceremony will open with an introduction by Wilmarth S. Lewis, chairman, the Yale Corporation's Committee on the Library and Museum. A feature will be the presentation of a gift for the rotunda from the class of 1891 in memory of Dr. Harvey Cushing, New Haven. Starling W. Childs, a member of the class, will make the presentation and Charles Seymour, LL.D., president of the university, will accept the gift for the university and Dr. Francis G. Blake, dean, for the school of medicine. Dr. John Homans, clinical professor of surgery, Harvard Medical School, Boston, will give the address and Rev. George Stewart, minister of the First Presbyterian Church, Stamford, will deliver the benediction. The new building was made possible through an appropriation of \$600,000 from the estate of John W. Sterling, who graduated at Yale in 1864. It is located on the grounds of the Yale University School of Medicine and is designed as an extension to the library wing of the Sterling Hall of Medicine. The building is Y-shaped and combines facilities for studies based on the history of medicine and the medical sciences with those for more strictly professional study for the practice of medicine and the prosecution of medical research. The Historical Library, of which the nucleus is the recently acquired Cushing collection, is in one branch of the Y and the General Medical Library in the other, with separate reading rooms for each. The Beaumont Room, in which will be displayed items from the Beaumont Collection, will be located centrally on the second floor. This room will also serve for lectures, seminars and meetings. The building will provide offices and studies. With its stack rooms and bookshelves on all floors it will be capable of housing upward of 400,000 volumes, providing space to meet future growth. There is also provision for a well equipped photographic laboratory and for storage of films.

### ILLINOIS

**Society News.**—Dr. Willard C. Scrivner, East St. Louis, discussed "Management of Piacenta Praevia and Premature Detachment of the Placenta" before the Madison County Medical Society in Collinsville, April 4.—Dr. Clinton W. Lane, St. Louis, discussed "Contact Dermatitis" before the Peoria Medical Society, April 15.—The Sangamon County Medical Society was addressed in Springfield, May 1, by Drs. Millard F. Arbuckle and Brian B. Blades, both of St. Louis, on "Lung Abscess from the Standpoint of the Bronchoscopist" and "Pulmonary Resection" respectively.—Dr. William Thompson, St. Louis, discussed "Management of Acute Abdominal Emer-

gencies" before the Adams County Medical Society, Quincy, April 14.—Dr. Charles E. Galloway, Evanston, discussed "Pathology of the Cervix" before the Rock Island County Medical Society, May 13, in East Moline.

**Zoologist Joins Illinois Staff.**—Carl G. Hartman, Ph.D., research associate in embryology of the Carnegie Institution of Washington, Johns Hopkins University School of Medicine, Baltimore, has been appointed professor of zoology and head of the departments of zoology and physiology at the University of Illinois, Urbana, effective September 1. Science reports that a consolidation of the two departments is anticipated. Victor E. Shelford, Ph.D., professor of zoology at Illinois, will continue his research with a reduced teaching load, it was stated. Dr. Hartman received his degree of doctor of philosophy at the University of Texas in 1915.

### Chicago

**Branch Societies.**—Dr. George H. Gardner discussed "Differential Diagnosis and Management of Leukorrhea" before the Northwest Branch of the Chicago Medical Society, April 18, and Dr. Chauncey C. Maher, "Management of Cardiac Edema." Dr. Cleveland J. White addressed the Calumet Branch, April 18, on "Common Skin Disorders and Their Modern Management." Among others, Drs. LeRoy H. Sloan and Chester C. Guy addressed the Jackson Park Branch, April 17, on "Spinal Cord Tumor" and "A Common Error in Diagnosis of Appendicitis in Women." Dr. Willard O. Thompson discussed "Sex Hormones: Clinical Application" before the West Side Branch, April 17. The Stock Yards Branch was addressed, April 17, by Drs. Ben Z. Rappaport on "Allergy in Infants and Children" and Francis E. Sencar, "Common Skin Disorders in Infants and Children." Dr. Adolph Hartung addressed the North Shore Branch, May 6, on "Abdominal Tumors of Questionable Origin" and Drs. Jay M. Garner, Winnetka, and Jerrold P. Nesselrod, Evanston, "Cinematographic Proctoscopy in Color."

**New Publication Committee.**—The president of the University of Chicago has appointed five members of the faculty to a committee on biology and medicine to further the publication through the University Press of books in the field of medicine and the biologic sciences. Members of the committee are William H. Taliaferro, Ph.D., dean of the Division of Biological Sciences and chairman of the department of bacteriology and parasitology and Eliakim H. Moore distinguished service professor of parasitology; Drs. Franklin C. McLean, professor of pathologic physiology; Charles Phillip Miller, associate professor of medicine; Lester R. Dragstedt, professor of surgery, and Thomas Park, Ph.D., assistant professor of zoology. The committee will advise the University of Chicago Press of research suitable for publication, will plan needed texts and will act as a possible outlet for valuable work now being done throughout the country in the biologic and medical fields. In the matter of securing manuscripts, the committee will be assisted by an advisory group, one man from each department of the biologic sciences at the university. Appointments to the newly formed committee are for five years. It replaces the committee on medical monographs.

### INDIANA

**First Year of Premarital Examinations.**—A report on the first full year of operation of Indiana's premarital blood test law showed that positive results were obtained in tests for syphilis in 1.6 per cent of marriage license applicants, newspapers reported April 18. In the twelve months dating from March 1, 1940, when the law became effective, 64,913 tests were made; of these 1,098 showed positive syphilis reactions. The report shows that 31,038 tests were made on pregnant women with 450 having positive reactions. In the United States Army selective service group from Indiana 33,017 serologic tests were made and 321, or 3.8 per cent, showed positive reactions, newspapers stated.

**District Meetings.**—Physicians of the Sixth Councilor District met in New Castle, May 16, to hear, among others, Lieut. Col. Irving H. Willett, Fort Wayne, discuss "The Army Medical Service and the Doctor."—At a meeting of the Ninth Councilor District Medical Society in Frankfort, May 22, Dr. Arthur F. Weyerbacher, Indianapolis, addressed the banquet session on "Romance and Venereal Disease."—Speakers before the Tenth Councilor District Medical Society in Gary, May 14, included Dr. Samuel Feinberg, Chicago, on "Allergy of the Nose."—The Eleventh Councilor District Medical Society was addressed in Kokomo, May 21, among others, by Dr. William R. Cubbins, Chicago, on "Chest Injuries, Abdominal Injuries and Fractures of the Extremities."



## IOWA

**Twin Lakes District Meeting.**—The eighteenth annual assembly and dry diagnostic clinic of the Twin Lakes District Medical Society will be held at Rockwell City June 19, under the presidency of Dr. John R. Christensen, Eagle Grove. Dr. Roy W. Fouts, Omaha, will open the program with a talk on the "Art of Medicine." The following will conduct clinics:

Dr. Charles C. Dennie, Kansas City, Mo.  
Dr. Archibald Ross McIntyre, Omaha.  
Dr. Gordon B. New, Rochester, Minn.  
Dr. Waltman Walters, Rochester.  
Dr. George E. Fahr, Minneapolis.

Dr. Carl M. Peterson, Secretary, Council on Industrial Health, American Medical Association, Chicago, will conclude the day's program with an address entitled "The Private Practitioner and Industrial Preparedness."

## KENTUCKY

**Donates Library for Negro Physicians.**—Dr. August Schachner, Louisville, has given a collection of 1,000 medical volumes for the use of Negro physicians. The library is housed in the Western Colored Library under the care of the Louisville Free Public Library in a special Schachner Memorial Room. Dr. Schachner, now 80 years old, made the presentation, and addresses were made by Drs. Rettig Arnold Griswold, professor of surgery, University of Louisville School of Medicine; Orville L. Ballard, Waverly Hills, secretary of the Falls City Medical Association, and Coleman Milton Young Jr., director of the Central Louisville Health Center, among others. Letters were read from Drs. Arthur T. McCormack, secretary of the Kentucky State Medical Association, and Irvin Abell, former president of the American Medical Association, both of Louisville.

## MAINE

**State Medical Meeting.**—The eighty-ninth annual session of the Maine Medical Association will be held at the Marshall House, York Harbor, June 22-24, under the presidency of Dr. Thomas A. Foster, Portland. The scientific program has been divided into conferences covering the following topics: traumatic surgery, cardiac lesions, obstetrics, otolaryngologic pediatrics and surgery. A symposium on vascular and arterial diseases will be presented by Drs. Laurence B. Ellis, Burton E. Hamilton and Reginald H. Smithwick, all of Boston. There will also be a symposium on problem fractures. Among the speakers on the program will be:

J. Ernestine Becker, D.Sc., specialist in nutrition, Children's Bureau, U. S. Department of Labor, Washington, D. C., "The Vitamins, What They Are, What They Do for You, and Where You Get Them."  
Dr. John F. Holmes, Manchester, N. H., "A Study of the Slipping Rib Cartilage Syndrome."  
Dr. Henry B. Elkind, Boston, "Practical Aspects of the Modern Mental Hygiene Movement."  
Dr. William Dameshek, Boston, "The Spleen: Facts and Fancies."  
Dr. Arthur W. Allen, Boston, "Gastric Ulcer and Its Relationship to Cancer."

At the dinner Monday evening "fifty year" medals will be presented to the following: Drs. Lindley Dobson, Presque Isle; Willey Edgar Sincok, Caribou; William H. Bradford, Portland; George A. Gregory, Boothbay Harbor; Nathaniel H. Crosby, Milo, and Ernest A. White, Columbia Falls. The annual dinner Tuesday evening will be addressed by Gov. Sumner Sewall and Dr. Frank H. Lahey, Boston, President of the American Medical Association.

## MINNESOTA

**Osteopath's Eight Year Sentence Upheld.**—On April 10, 1941 the Supreme Court of Minnesota upheld the sentence of not to exceed eight years at hard labor imposed by Judge Kenneth G. Brill of the Ramsey County District Court on May 13, 1940 on Samuel M. Stern, St. Paul osteopath, under the state habitual criminal act. Stern pleaded guilty to an information charging him with the crime of abortion. The prior offense alleged, which resulted in the double sentence authorized under the habitual criminal act, was Stern's conviction of embezzlement Jan. 3, 1922 by a jury in Orange County, Calif. He served one year in the San Quentin prison and was then paroled. In September 1938 he obtained a pardon from former Governor Merriam of California "in order to restore his citizenship." Stern claimed in the present case that having been pardoned by the governor of California he could not be given a double sentence by Judge Brill in the abortion case. However, the supreme court of Minnesota upheld Judge Brill and pointed out that the legislature had not excepted pardoned prior criminal offenses from the habitual criminal law of this state and, therefore, Stern was properly sentenced by Judge Brill to a term of not to exceed eight years at hard labor.

## MONTANA

**State Medical Meeting in Great Falls.**—The Medical Association of Montana will hold its sixty-third annual session in Great Falls June 23-25, under the presidency of Dr. James I. Wernham, Billings. The preliminary program lists the following speakers:

Dr. Emile F. Holman, "Carcinoma of the Lung—Its Early Diagnosis and Treatment; Carcinoma of the Stomach—Its Early Diagnosis and Treatment by Aseptic Resection of the Stomach."  
Dr. Donald E. King, "Fracture of the Spine—Its Treatment and Complications; Fracture of the Upper Extremity."  
Dr. Charles W. Barnett, "Massive Dose Arsenotherapy in the Treatment of Syphilis; Prognosis and Treatment of Late Syphilis of the Cardiovascular System."  
Dr. Davis A. Ryland, "Management of Hypertension; Interpretation of the Newer Laboratory Methods."  
Dr. Maurice L. Tainter, "Chemotherapy, Including the Sulfanilamide Group; Practical Applications of the Sympathetic Drugs, Including Benzedrine."

Dr. Tainter will address the banquet Tuesday evening. All are members of the faculty of Stanford University School of Medicine, San Francisco. Sessions will be held by the Montana Academy of Oto-Ophthalmology, June 22-23, and the Montana Public Health Association, June 26-27.

## NEW MEXICO

**Health in New Mexico.**—The biennial report of the state department of public health, covering 1939-1940, shows that tuberculosis continues to be a major problem. From one half to two thirds of the cases originate outside the state, but it is said that tuberculosis among the native born is increasing as a result of their contact with health seekers. With the highest infant mortality rate in the United States reported for New Mexico, the health department has emphasized this subject, pointing out the 109 centers for maternal and child health clinics or conferences as community projects. Special instruction and supervision has been given to midwives and post-graduate instruction provided for physicians and nurses. In San Miguel County a demonstration unit has been established with funds provided by the Social Security Act. A nutrition program was started in January 1940 with federal funds, and a state nutrition council has been formed. Typhoid has declined since 1935; in 1940 there were 142 fewer cases than the average for the five preceding years. In 1935 there were 436 cases with 47 deaths. A pneumonia control program was operated from January to June 1940, during which time serum and sulfapyridine were provided without cost to patients unable to pay for them. A cancer control program, largely educational, was started at the beginning of the present fiscal year. In 1939 the state had 107 cases of poliomyelitis, the largest number reported during the past ten years. Selective service examinations taxed the public health laboratory from November through December 1940 with serologic tests for the diagnosis of syphilis; 2,210 specimens were examined, of which 95 gave evidence indicative of infection. An epidemic of rabies among dogs and other animals has been prevalent in the two years, the report says; in 1940 there was one human death from rabies. Demands for birth certificates as a result of the national defense effort placed a heavy burden on the division of vital statistics. A table showing major causes of death for 1939 gave the following rates per hundred thousand of population: heart disease 125.3, influenza and pneumonia 116.6, accidents 97.6, congenital malformations and diseases of infancy 81.8, tuberculosis 81.2, cancer 60.8, diarrhea and dysentery 58.9, nephritis 49.3, cerebral hemorrhage 47.3 and puerperal causes 15.2.

## NEW YORK

**Meeting of School Physicians.**—The New York State Association of School Physicians will hold its annual meeting and conference at the Grand Union Hotel, Saratoga Springs, June 23. A program has been arranged of interest to school physicians, health officers and general practitioners.

**Hospital News.**—New York Hospital-Westchester Division, White Plains, opened a new building for acutely ill women patients in March. The building, which has space for twenty beds, is called the Nichols Memorial Cottage in memory of Dr. Charles H. Nichols, superintendent of the hospital from 1877 to his death in 1889.

**Cornerstone Laid for Science Building.**—The cornerstone of the new Edward Bausch Hall of Science and History, the gift of Edward and Matilda Bausch to the Rochester Museum of Arts and Sciences, was laid recently. Robert A. Millikan, Ph.D., director of the Norman Bridge Laboratory of Physics and chairman of the executive council, California Institute of Technology, Pasadena, was the principal speaker.

**Health Officers' Conference.**—The annual Conference of Health Officers and Public Health Nurses will be held at Saratoga Springs, June 24-26. The provisional program announces the following speakers, among others:

Dr. Soma Weiss, Boston, Heart Disease.  
Dr. Russell M. Wilder, Rochester, Minn., Nutrition—A Public Health Problem.  
Dr. Lawrence Kolb, U. S. Public Health Service, Washington, D. C., Alcoholism and Public Health.  
Dr. Harry S. Mustard, New York, Trends in Public Health Administration.  
William F. Wells, Philadelphia, Radiant Disinfection of Air.  
Dr. Herbert A. Spencer, U. S. Public Health Service, Philadelphia, Health Conditions in Germany.

#### New York City

**Grant for Public Health Teaching.**—Cornell University Medical College has received a grant of \$600,000 from the Rockefeller Foundation for the endowment of the department of public health and preventive medicine. The department has been receiving an annual grant of \$28,000 for the past five years. The endowment will enable the college to expand its teaching in public health, it was said.

**Columbia Alumni Meeting.**—The Alumni Association of Columbia University College of Physicians and Surgeons held its annual meeting, May 6, at the De Lamar Institute of Public Health. A symposium on "What's New in Public Health" was presented by Dr. Harry Stoll Mustard, John W. Fertig, Ph.D., Frederick B. Flinn, Ph.D., Moses L. Isaacs, Ph.D., Dr. Ernest L. Stebbins and Prof. Earl B. Phelps. The annual dinner was held at the Hotel George Washington in the evening with Professor Phelps presiding and the following speakers: Dr. John L. Rice, city commissioner of health, Leonard J. Piccoli, Ph.D., and Dr. Mustard.

**Brooklyn Medical Library.**—In the Library of the Medical Society of the County of Kings and the Academy of Medicine of Brooklyn the number of books consulted increased from 63,665 in 1939 to 68,656 in 1940, while the number of books taken home decreased from 13,594 to 12,765. The number of current periodicals and serial publications on file was 1,459, but because of conditions abroad the library was actually receiving at the close of the year about 1,230. Financial support for the Brooklyn library is derived from the general funds of the society, from special societies that meet in the building, from other Brooklyn organizations, from health and welfare organizations and from many individual donors.

**Society News.**—Drs. Victor W. Eisenstein, Pittsburgh, Emanuel D. Friedman and Charles Davison addressed a combined meeting of the New York Neurological Society and the section of neurology and psychiatry of the New York Academy of Medicine, May 6, on "Brain Abscess of Uncommon Origin: Relation to Osteomyelitis of the Skull" and Dr. Leo Alexander, Boston, on "Electrical Injuries of the Central Nervous System."—A symposium on "sclerosing therapy" was presented before the Bronx County Medical Society, April 16, by Drs. Grant P. Pennoyer, Frank C. Yeomans, New York, and Daniel C. Patterson, Bridgeport, Conn.—Dr. William Cook Spain addressed the Academy of Pathological Science, May 2, on "Hypersensitiveness to Common Foods."—Drs. Thomas A. Shallow, Philadelphia, and James Murray Flynn, Rochester, addressed the Medical Society of the County of Kings, Brooklyn, April 15, on "The Surgical Aspects of Peptic Ulcer" and "The Individual Physician's Obligation to Medical Organization" respectively.

**Dr. Knapp Awarded Medal.**—The Leslie Dana Gold Medal, awarded annually for outstanding achievements in the prevention of blindness and the conservation of vision, will be presented this year to Dr. Arnold Knapp, formerly professor of ophthalmology at Columbia University College of Physicians and Surgeons. The medal is given by Mr. Leslie Dana of St. Louis through the St. Louis Society for the Blind and on the recommendation of the Association for Research in Ophthalmology. Dr. Knapp was born in New York in 1869 and graduated at Columbia University College of Physicians and Surgeons in 1892. He was professor of ophthalmology at his alma mater from 1903 to 1928. He was executive surgeon at the Herman Knapp Memorial Hospital until it merged last year with the Institute of Ophthalmology of the Columbia-Presbyterian Medical Center. For a number of years he has been editor of the *Archives of Ophthalmology*. He was also chairman of the Section on Ophthalmology of the American Medical Association, 1925-1926, a position held by his father, the late Dr. Herman Knapp, from 1878 to 1880. The American Ophthalmological Society awarded Dr. Knapp the Lucien Howe Medal in 1937.

#### NORTH CAROLINA

**State Medical Meeting and Election.**—Dr. Donnell B. Cobb, Goldsboro, was chosen president-elect of the Medical Society of the State of North Carolina at its annual meeting in Pinehurst May 2. Dr. Franklin W. Griffith, Asheville, was installed as president. Other officers include Drs. Thomas D. Sparrow, Charlotte, and Thomas L. Carter, Gatesville, vice presidents, and Roscoe D. McMillan, Red Springs, secretary-treasurer. The 1942 meeting will be in Charlotte. Speakers who addressed general sessions were:

Dr. Frank H. Lahcy, Boston, President of the American Medical Association, Developments in Medicine, Economic and Scientific.  
Dr. Louis H. Clerf, Philadelphia, Tumors of the Larynx and Hypopharynx.  
Dr. Thomas M. Watson, Greenville, Appendicitis in Small Children.  
Dr. James Watson, Raleigh, The Medical Profession and the Problem of Mental Disorder.  
Dr. Wilburt C. Davison, Durham, The First Ten Years of Duke University School of Medicine and Duke Hospital (McBrayer Memorial Lecture).  
Dr. James W. Tankersley, Greensboro, Surgical Aspects of Splenic Disease.  
Dr. William T. Rainey, Fayetteville, Management of Congestive Heart Failure.  
Major Elmus D. Peasley, Raleigh, The Physical Status of the Selective Service Draftees.  
Dr. Charles Hampton Mauzy Jr., Winston-Salem, Cesarean Section, Incidence and Fetal Mortality in Some Cities in North Carolina.

The North Carolina Public Health Association held its annual meeting May 19, with Dr. Harry Stoll Mustard, New York, as guest speaker on "Relationships in State and Local Public Health Work."

#### OHIO

**New Medical Supervisor for Industrial Commission.**—Dr. Henry P. Worstell, Columbus, who has been assistant supervisor of the medical section of the State Industrial Commission, has been appointed supervisor. He succeeds Dr. Sidney M. McCurdy, Columbus, who resigned.

**Personal.**—Dr. Chester A. Spittler, Middletown, has been named health commissioner of the town to succeed the late Dr. George D. Lummis.—Dr. Alfred P. Cole, Cincinnati, has been appointed medical director of the Hamilton County Home and Chronic Disease Hospital, Cincinnati, to succeed Dr. Miles J. Scott, it is reported.—Dr. George F. Ziminger, Canton, was guest of honor at the annual dinner of the Canton Academy of Medicine recently, celebrating his completion of fifty years in the practice of medicine.

**Society News.**—Dr. Walter L. Dandy, Baltimore, addressed the Academy of Medicine of Cincinnati, April 15, on "Diagnosis and Treatment of Lesions of the Cranial Nerves." Dr. John de J. Pemberton, Rochester, Minn., was the speaker, April 29, on "Present Status of Surgery of the Spleen."—Dr. Warren T. Vaughan, Richmond, Va., addressed the Academy of Medicine of Cleveland, May 16, on "Allergy and Its Relation to Chronic Diseases." The academy orchestra gave its spring concert in Severance Hall, May 10, for the benefit of the Health Education Foundation.—Dr. John A. Toomey, Cleveland, addressed the Mahoning County Medical Society, Youngstown, May 20, on "Diagnosis and Treatment of Scarlet Fever, with Special Reference to the Use of Sulfanilamide, Scarlet Fever Antitoxin and Convalescent Serum" and on "The Portal of Entry of Poliomyelitis." Dr. Edward H. Cary, Dallas, Texas, was the speaker June 6 on "Political Medicine."

#### PENNSYLVANIA

**Society News.**—Dr. Andrew B. Fuller, Pittsburgh, addressed the McKeesport Academy of Medicine, April 28, on "Hypertension and Coronary Diseases."—Dr. Gilson C. Engel, Philadelphia, addressed the Lebanon County Medical Society, Lebanon, May 13, on "Diseases of the Thyroid Gland."—Dr. Francis F. Borzell, Philadelphia, addressed the Northampton County Medical Society, May 16, at the Northampton Country Club near Easton on "What Medical Defense Means to the County Societies."

#### Philadelphia

**Special Meeting on Nutrition.**—The committee on nutrition and deficiency diseases of the Philadelphia County Medical Society and the Philadelphia Child Health Society sponsored a special meeting on nutrition May 9, with the following speakers: Drs. Rufus S. Reeves on "Nutrition—The Cornerstone of National Defense"; Herbert T. Kelly, "Medical Aspects of Nutrition"; Ralph M. Tyson, "Effect of Nutrition of the Mother on the Health of the Baby," and Pauline Beery Mack, Ph.D., State College, "Mass Studies in Human Nutrition."

**Doctors' and Nurses' Night.**—The Philadelphia County Medical Society devoted its meeting May 14 to "Doctors' and Nurses' Night." Nursing facilities available to physicians and patients in Philadelphia County were explained by representatives of official groups of nurses and the following addresses were given: Drs. Edgar van Nuys Allen, Rochester, Minn., on "The Blood Pressure Problem"; Francis F. Borzell, "The Handmaiden of Modern Medicine"; Miss Katharine Tucker, director of nursing education, University of Pennsylvania, "Nursing and National Defense," and Mrs. Katharine Miller, general secretary, Pennsylvania State Nurses' Association, "Pennsylvania and the Nursing Inventory."

#### Pittsburgh

**Medical Research at Mellon Institute.**—The annual report for the thirtieth year of the Mellon Institute of Industrial Research, for the fiscal year ended March 1, states that the institute has spent \$1,258,866 in studies in pure science. There have been 187 fellows and 114 fellowship assistants working under ninety-three industrial fellowships. Chemical, bacteriologic and clinical investigations on the chemotherapy of pneumonia have continued to be important in the institute's program in cooperation with a staff of medical associates at Mercy Hospital in Pittsburgh. Other phases of chemotherapy have been under investigation at the Western Pennsylvania Hospital, notably natural resistance factors in pneumococcal infection and the common cold and in basic bacteriologic experimentation bearing on therapeutic procedure. Another project is concerned with pharmacopeial standards for surgical dressings and gut and silk sutures. During the past year the nutrition fellowship of the Buhl Foundation terminated its five year program of research on the relation of foods to dental caries. The conclusion was reached that preeruptive influences are dominant in the subsequent susceptibility of rat teeth to caries. Air Hygiene Foundation, whose headquarters are in the institute, is reported to be revising its programs of medical and engineering research to stress projects of more immediate benefit in the national emergency. More attention is to be given to chemical hygiene, a study of sick absenteeism in industry and plant surveys for member companies to combat occupational hazards incident to increased production. This foundation supports research at the Harvard School of Public Health, the Saranac Laboratory at Saranac Lake, N. Y., and the University of Pennsylvania, Philadelphia.

#### VIRGINIA

**Regional Meetings.**—At a meeting of the South Piedmont Medical Society in Danville, April 16, the speakers included Drs. Edwin C. Hamblen, Durham, N. C., on "Diagnosis and Treatment of Ovarian Failure During the Reproductive Period"; Porter P. Vinson, Richmond, "Significance of Difficulty in Swallowing"; George B. Craddock, Lynchburg, "Sulfonamide Drugs"; Isham K. Briggs, South Boston, "Treatment of Industrial Injuries," and Samuel R. Newman, Danville, "Convulsions During Anesthesia." Dr. Edwin E. Barksdale, Danville, was elected president.—A symposium on pain was presented at the spring meeting of the Southwestern Virginia Medical Society in Pulaski, April 18, by Drs. Isaac A. Bigger, William B. Porter, Robert Finley Gayle Jr., William Gayle Crutchfield and Carrington Williams, all of Richmond. In the evening Dr. Walter B. Martin, Norfolk, president of the Medical Society of Virginia, gave an address on "The Use of Sulfanilamide Drugs by the General Practitioner with Special Reference to Toxic Reactions."

#### WISCONSIN

**George Crownhart Dies Suddenly.**—Jesse George Crownhart, Madison, since 1923 executive secretary of the State Medical Society of Wisconsin, died June 5 of coronary thrombosis while attending the Annual Session of the American Medical Association in Cleveland. Mr. Crownhart was born in Superior, Oct. 8, 1896, and graduated from the University of Wisconsin in 1921. For the subsequent two years he served as legislative correspondent for the Holmes News Service. Since 1923 he has been executive secretary of the state medical society and managing editor of the *Wisconsin Medical Journal*. He was secretary of the Wisconsin Hospital Association, 1930-1937, and a member of the governor's Committee on Public Welfare, 1936-1937, and was for many years an officer in the Wisconsin National Guard. He was a member of the Wisconsin Historical Society, American Hospital Association, Wisconsin Press Association, and National Collegiate Players. He was joint author of "Who's Who at Wisconsin," 1920, and "Medical Blue Book of Wisconsin," 1928 and 1929. In 1937

the state medical society sent Mr. Crownhart abroad to study medical care operating under governmental control in various countries; his report, entitled "Sickness Insurance in Europe," was published in 1938. Mr. Crownhart was an indefatigable worker and an able administrator.

#### PHILIPPINE ISLANDS

**Department of Health and Public Welfare.**—The Philippine legislature has approved the creation of a department of health and public welfare to take the place of the former administration as a division of the department of public instruction. Dr. Jose Fabella, Manila, who has been commissioner of health and welfare under the former arrangement, has been appointed secretary of health, and Dr. Hilario Lara, Manila, is undersecretary. The *Journal of the Philippine Medical Association* notes that the association has been urging the creation of this separate department of health in its official deliberations since 1931. Previously a law authorizing such a department was passed by the legislature in 1923, but it was vetoed by Governor General Leonard Wood, who nevertheless expressed his favorable opinion of it in principle, the *Journal* said.

#### GENERAL

**League of Nations Narcotic Office Moved to Washington.**—According to the Washington (D. C.) *Times-Herald*, April 12, the narcotics division of the League of Nations has been moved to Washington from Geneva, Switzerland. It was said that powers involved in the European war are still contributing to the cooperative effort to regulate the flow of narcotics among the sixty-seven nations participating in the international narcotics agreements.

**Association for Study of Neoplastic Diseases.**—The summer meeting of the American Association for the Study of Neoplastic Diseases will be held at Johns Hopkins Hospital, Baltimore, June 26-28, under the presidency of Dr. Roscoe W. Teahan, Philadelphia. The meeting has been planned partly as a demonstration of gross and microscopic pathology and partly a demonstration of x-ray films and lantern slides. Every member is urged to attend, bringing both microscope and material for presentation. Dr. Eugene R. Whitmore, 2139 Wyoming Avenue, N.W., Washington, D. C., is the secretary. The annual meeting of the association will be held in Washington, September 4-6.

**Fellowships Awarded in Cancer Research.**—The Finney-Howell Research Foundation, Inc., Baltimore, announces that the following fellowships have been awarded for research into the cause or causes and the treatment of cancer:

Dr. Glenn Horner Algire, to work at the National Cancer Institute, Bethesda, Md.  
Dr. Joseph Gilbert Hamilton, to work at the Radiation Laboratory, University of California, Berkeley.  
Dr. Rose I. Shukoff, to work at the Glasgow Royal Cancer Hospital, Glasgow, Scotland.

Fellowships were renewed for a year for Margaret Nast Lewis, Ph.D., Berkeley, Calif.; Bernard E. Kline, M.S., Madison, Wis.; Dr. Julius B. Charles Abels, New York; Alfred Marshak, Ph.D., Berkeley; Dr. Jolin F. Menke, San Francisco, and Dr. Paul C. M. Zamecnik, New York. Fellowships carrying an annual stipend of \$2,000 are awarded for the period of one year, with the possibility of renewal up to three years, at the annual meeting of the board of directors, held at the end of February. Applications must be made on blanks furnished by the secretary and filed in the office of the foundation before Jan. 1, 1942.

**Association on Mental Deficiency.**—The sixty-fifth annual convention of the American Association on Mental Deficiency will be held in Salt Lake City, June 20-24, under the presidency of Meta L. Anderson, Ph.D., Newark, N. J. The speakers will include:

Dr. Gilbert J. Rich, Milwaukee, The Borderline Defective in the Community.  
Dr. E. Arthur Whitney, Elwyn, Pa., The Municipal Court of Philadelphia Studies the Problem of Mental Deficiency.  
Sidney L. Halperin, M.A., and Dr. George M. Curtis, Columbus, Ohio, Anhidrotic Ectodermal Dysplasia Associated with Mental Deficiency.  
Dr. Emilian O. Houda, Tacoma, Wash., Most Primary Factors Necessary to the Increasing Incidence of Cretinism.  
Dr. Charles C. Hawke, Winfield, Kan., Castration versus Vasectomy in the Feebleminded as a Surgical Problem.  
Dr. Louis P. Harshman, Fort Wayne, Ind., Human Sterilization Before Puberty.  
Dr. James Lewald, Laurel, Md., Cortical Excision for the Allaying of Tremor.  
Dr. Theodore A. Watters, New Orleans, Detecting Schizophrenic Personalities.  
Dr. George A. Jervis, New York, Certain Neuropathological Studies of Mental Deficiency at Letchworth Village.

**Memorial to Father of American Pharmacy.**—A bronze statue of William Proctor Jr., designated the "Father of American Pharmacy," was unveiled in the foyer of the American Institute of Pharmacy, Washington, D. C., May 3, the one hundred and thirty-fourth anniversary of his birth. William Marks Simpson, Baltimore, is the sculptor of the statue. The presentation was made to the American Pharmaceutical Association. Ivor Griffith, Pharm.D., president of the Philadelphia College of Pharmacy and Science, delivered the principal address. William Proctor Jr. was born in Baltimore in 1817. In 1831 he apprenticed himself to a pharmacist in Philadelphia and graduated at the Philadelphia College of Pharmacy and Science in 1837. He conducted his own pharmacy from 1844 in Philadelphia until his death in 1874. In 1840 he became a member of the Philadelphia College of Pharmacy, in 1841 he was elected to its board of trustees, in 1855 he was made corresponding secretary, in 1867 he became vice president and in 1872 he accepted the chair of pharmacy on the death of Prof. Edward Parrish. He was one of the founders of the American Pharmaceutical Association, serving as president in 1862.

**Surgery Board Acts to Certify Proctologists.**—At the annual meeting of the American Board of Surgery May 1 a plan of examination to certify proctologists was adopted by members of the board of surgery and representatives of the proctologists. This plan requires that every candidate wishing to be qualified in the field of proctology by examination shall meet all the requirements exacted by the American Board of Surgery as to training and pass its examinations. If the candidate passes the prescribed examinations and becomes eligible for certification by the board of surgery he shall then take an additional examination to be given by an examining committee appointed by the proctologic group in that special field. On the passing of this additional examination, which may follow immediately on the final one given by the American Board of Surgery, he may then be certified by the American Board of Surgery as having been qualified in general surgery with special reference to the field of proctology. At the recent meeting the American Board of Surgery elected the following officers, among others: Drs. Allen O. Whipple, New York, chairman; Fred W. Rankin, Lexington, Ky., vice chairman, and John Stewart Rodman, Philadelphia, secretary-treasurer.

**Northwest Medical Association.**—The eighteenth annual meeting of the Pacific Northwest Medical Association will be held at the Davenport Hotel, Spokane, Wash., June 25-28. The ten speakers on the program will each present three papers:

- Dr. Russell L. Cecil, New York, Diagnosis and Treatment of Infectious Arthritis, of Osteoarthritis and of Gouty Arthritis.
- Dr. Louis H. Clerf, Philadelphia, Clinical Significance of Hoarseness and Its Importance in Cancer of the Larynx; Bronchoscopy in Non-tuberculous Pulmonary Disease; The Esophagus and Its Diseases.
- Dr. Louis J. Karnosh, Cleveland, Neuritis and Avitaminosis; Mental Disorders Associated with Bodily Disease; Traumatic Neuroses and Psychoses.
- Dr. William J. Kerr, San Francisco, Clinical Use of the Symballophone; Pathologic and Physiologic Factors in Coronary Occlusion; Treatment of Angina Pectoris.
- Dr. Perrin H. Long, Baltimore, Experimental, Biological and Pharmacologic Background of Bacterial Chemotherapy; Clinical Use of Sulfanilamide, Sulfapyridine, Sulfathiazole; Recognition and Importance of the Toxic Manifestations of Sulfanilamide and Its Derivatives.
- Dr. Carleton Mathewson Jr., San Francisco, The Ambulatory Treatment of Certain Fractures of the Lower Extremities; The Management of Extensive Burns; The Treatment of Compound Fractures.
- Dr. John deJ. Pemberton, Rochester, Minn., Surgery of the Thyroid Gland; Lesions of the Colon and Rectum; Present Status of Surgery of the Spleen.
- Dr. Samuel Soskin, Chicago, The Fundamentals of the Physiology of Diabetes; Carbohydrate Utilization and Carbohydrate Tolerance; The Endocrine Balance in Carbohydrate Metabolism.
- Dr. William Dock, San Francisco, The Nature and Effects of Arterial Hypertension; Albuminuria and Nephrosis; Cirrhosis of the Liver.
- Dr. Leighton C. Conn, Edmonton, Alta., Amnesia and Analgesia During Labor; Hemorrhage During Labor; Vaginal Discharges and Their Treatment.

**Special Society Elections.**—New officers of the Association of American Physicians chosen at its annual meeting in Atlantic City, N. J., recently include Drs. James Howard Means, Boston, president; George Blumer, New Haven, Conn., vice president, and Hugh J. Morgan, Nashville, Tenn., secretary.—Dr. Arthur H. Ruggles, Providence, R. I., was named president-elect of the American Psychiatric Association at its annual meeting in Richmond, Va., in May and Dr. James K. Hall, Richmond, was installed as president. Dr. Winfred Overholser, Washington, D. C., is secretary-treasurer.—Dr. John J. Wittmer, New York, was chosen president-elect of the American Association of Industrial Physicians and Surgeons at its annual meeting in Pittsburgh May 9 and Dr. Theodore Lyle Hazlett, Pittsburgh, was inducted into the

presidency. Dr. Edward C. Holmblad, Chicago, was named to the newly created position of managing director. Cincinnati was selected as the place for the 1942 meeting.—Philip Drinker, S.D., Boston, was chosen president-elect of the American Industrial Hygiene Association at its meeting in Pittsburgh in May and Donald E. Cummings, B.S., associate professor of medicine and director of the division of industrial hygiene of the University of Colorado School of Medicine, Denver, was installed as president. Gordon C. Harrold, Ph.D., of the Chrysler Corporation, Detroit, was reelected secretary and Theodore Hatch, Philadelphia, was reelected treasurer.—Officers of the American Society for Pharmacology and Experimental Therapeutics chosen at its meeting in April include Drs. Eugene M. K. Geiling, Chicago, president (reelected); Carl F. Schmidt, Philadelphia, vice president; Raymond N. Bieter, Minneapolis, secretary; Erwin E. Nelson, New Orleans, treasurer.

## CORRECTION

**Dr. Brücke Did Not Go to East Indies.**—An item in the Student Section, May 31, stated that Dr. Ernst Th. von Brücke of the physiology department of Harvard Medical School, Boston, was en route to the Dutch East Indies to work with the Dutch army. This was erroneous. It was Dr. A. Colaco Belmonte, formerly of Amsterdam, who was en route to the Dutch East Indies and who a few years ago served with a Red Cross unit sent by the Netherlands to Ethiopia and more recently to Finland.

## Government Services

### Changes in Public Health Service

A list of official orders from the U. S. Public Health Service announces the following changes:

- Sr. Surg. Herbert A. Spencer, relieved at Berlin, Germany, and ordered to proceed to U. S. Immigration Station, Ellis Island, for duty.
- Acting Asst. Surg. Jeremiah J. Donovan, relieved at Toronto, Canada, and ordered to Havana, Cuba, to report to American Consulate General for duty.
- Asst. Surg. Ralph B. Dawson, relieved at Ellis Island, N. Y., and ordered to London, England, for duty.
- Passed Asst. Surg. Erwin W. Blatter, relieved at London and ordered to U. S. Quarantine Station, Baltimore.
- Asst. Surg. Wixom S. Sibley, relieved at Terminal Island, Calif., and ordered to U. S. Quarantine Station, Honolulu, T. H., for duty.

The following have recently been promoted to the titles indicated: Drs. Roscoe R. Spencer, Sanders L. Christian, Royd R. Sayers, Paul M. Stewart and Walter C. Teufel, all medical directors; Carl V. Morrison, Charles G. Spicknall, Vernam T. Davis and Harold T. Castberg, all passed assistant surgeons.

### Navy Medical Center at Bethesda

The first unit of the U. S. Naval Medical Center under construction at Bethesda, Md., is nearing completion, newspapers reported April 20. The entire project, when finished, will cost \$4,850,000. With a normal capacity of six hundred and fifty beds, it is so arranged that by additional construction in a time of national emergency accommodations will be available for eighteen hundred beds. The unit now nearing completion forms the central tower of the main building and consists of sixteen stories, to house the administrative section, the surgical section including the operating rooms, the x-ray rooms and physical therapy equipment including an orthopedic pool to be used in cases of bone injuries to reduce time of hospitalization. In addition, board rooms and sick officers' quarters will be in the tower, together with the medical library of 22,000 volumes. In the front wings of the central building, three stories in height, will be the medical and dental schools, while the rear wings, also three stories high, will contain thirty-bed wards with room enough for about 100 patients to a wing. In addition to the main building, there will be erected quarters for some of the thirty-five medical officers and six dental officers on the institution's staff, a building for fifty nurses, and barracks for the two hundred and fifty navy hospital corpsmen. The entire plant will occupy more than 200 acres and replace existing facilities in Washington which are now considered inadequate.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

April 12, 1941.

#### Pulmonary Tuberculosis in the Navy

At the Section of Epidemiology and State Medicine of the Royal Society of Medicine, Surgeon Rear Admiral Dudley, F.R.S., opened a discussion on pulmonary tuberculosis in the royal navy. He said that since the beginning of the century the invaliding rate for the disease had remained at about 2 per thousand, although the greatest efforts had been made to improve the environment by better ventilation, dust extraction and better diet, and to improve diagnosis by periodic overhauls of the men. Yet during this period the mortality in the country from tuberculosis had been nearly halved. The prevalence of tuberculosis in the navy was due to the factor of population density, which could not be eliminated or even reduced. The purpose for which a warship was designed prohibited any increase of deck space per man, and more and more men were required to work the complicated machinery. The yearly incidence of 2 per thousand seemed to be irreducible and was double the figure for the army and the air force, although the navy had a large proportion of boys and men at those younger and older ages which in civil life showed the lowest incidence of tuberculosis. The closeness of community life on the quarter deck was the determining cause of tuberculosis in the naval ratings. Among the naval officers the yearly incidence was less than 1 per thousand. They nearly always slept in separate cabins and their living accommodation was more spacious.

All men in the navy suspected of having pulmonary tuberculosis were at once examined with the roentgen rays. Little effect on the incidence could be expected from this examination of recruits or of limited numbers of contacts, and periodic roentgen ray examination of the total force by the usual method was impracticable. Therefore mass examination by miniature photoradiography was introduced as less cumbersome and less expensive. No man would be labeled tuberculous on the evidence of a miniature film until a full size film had been taken.

#### Social Work in Air Raid Shelters

In an address to the Royal Society of Arts on "The Modern Troglodyte," Lord Horder, who was appointed by the government to inspect and report on air raid shelters, said that we heard a lot about foreigners crowding into the shelters, but these folk were under British protection and we must give them security and care for them. That was where we differed from the Nazis. This great and cataclysmal upheaval had brought into the shelters for inspection the slum conditions of which we said we were ashamed. For many of these citizens what the authorities had now been able to establish represented better and happier conditions than they had before night bombing began. This was an indictment of what had been called "our social system." These folk now enjoyed a communal life, though of a rudimentary sort, which bred a spirit of good temper and dignity; it enabled them to adapt themselves to the nation's exigency and spirit. That it should have needed a war and life under ground for half of the twenty-four hours to achieve a result which was bringing joy to the hearts of social workers was a humiliating thought. To get among the ordinary folk and give them sane, simple and homely advice was the dream of doctors with any vision for one hundred years. Here was field work of the best kind in preventive medicine: to keep the fit fit and to make the near fit fit. He believed that from these severe trials would emerge a group of people better fitted to arrange the pattern of their lives in the better days that all were determined to have in the future.

#### The Casualties of "The Battle of Britain"

For the first time a connected account of the three months almost continuous daylight fighting against the luftwaffe, known as "the battle of Britain," August-October 1940, has been given in an official pamphlet. No fewer than 2,375 German aircraft were known to have been destroyed and many others must have been. The British losses were 375 pilots killed and 358 wounded. In daylight 1,700 persons, nearly all civilians, were killed and 3,360 seriously wounded. At night 12,581 were killed and 16,965 injured. In this greatest air battle in history the German air force was reduced from a confident machine-like organization to a shattered and disordered armada. The object was to obtain a quick decision by destroying our air power and so render invasion possible. Massed formations of bombers escorted by fighters in the initial stage made twenty-six attacks on our ports and shipping. They next attacked fighter airdromes. Attacks were then delivered against inland airdromes and aircraft factories and also against residential districts. Waves of formations of from twenty to forty bombers, protected by a greater number of fighters, were sent over at intervals of twenty minutes. This continued from September 7 to October 5 as the last desperate attempt to obtain victory. Much damage was done but at a cost the Germans could not stand. In one month they lost 883 aircraft. The British losses were less than a sixth of the German.

#### Preparations Against a Gas Attack

A campaign to tighten up the organization for meeting a gas attack from the air on the civilian population has begun. In the presence of the inspector general of air raid precautions, tests were made in different London districts with tear gas, which had a satisfactory effect on the inhabitants, who took care to have their respirators ready for use. One object was to ascertain how quickly gas could be detected by patrolling wardens and how wardens in neighboring areas would act. To help practical training, a convoy of casualty service vehicles was driven through the concentration of gas, together with a section of the auxiliary fire service, whose members carried out a "dry hose drill." Another concentration of gas was laid outside a large department store and adjoining streets and premises as a test for the anti-gas precautions in the district and the air raid precautions service in the store, while the effects on the customers in the store were especially noted. An important point observed was the extent to which the gas penetrated the building and the height at which it might be effective.

The public response to the appeal of the authorities for cooperation was admirable. Gas masks were put on whenever they were required, and the injunction not to take cover or attempt to get into the shelters before putting them on was strictly obeyed. Persons carrying parcels obeyed the instruction to place them on the ground where they stood and then put on the masks. It is intended to repeat these tests, which were made at the request of the government, in other parts of the country.

The danger of invasion seems to have become more remote in consequence of the Balkan war. But the government has shown by repeated warnings that it expects a gas attack on the civilian population. It has issued to householders fifteen million leaflets entitled "What to Do about Gas." They contain the following: "The danger is not serious if you do the right thing. In your gas mask you have the best possible protection against gases that affect your lungs or eyes. Carry your mask always. Buy a jar of antigas ointment. If the rattles sound, put on your mask and take cover and keep it on until you hear handbells ringing the "Gas clear." Cover your skin up outdoors—hands in pockets, collar turned up. If you have an umbrella, put it up. Never look upward—you may get a drop of liquid gas in the eye. If you breathe any gas or vapor put on your mask at once. If the irritation is serious, go to a



first aid post. If you are splashed with liquid gas from a bomb and you can see the dark splash on your skin or clothing, dab, not wipe, as much as you can of the liquid off your skin and then rub in the ointment. Your handkerchief has become dangerous—destroy it. If you have not the ointment, wash at once with soap and water. This may save you a bad burn. Take off any splashed outer garment at once, before the liquid soaks through. If you are within five minutes of any place where you can get a wash, go there and wash yourself. Before going in, take off your shoes and any clothing which you think has been splashed.

"Poison gases will not always affect exposed foods to such an extent that they become dangerous, but in any case simple precautions will protect your foods. Food in cans or airtight bottles is perfectly safe, and flour, rice, tea and butter should be kept in tins or jars with fitting lids. Refrigerators are very good protection. If there is any risk that your food or water may have been contaminated, do not attempt to deal with them yourself. Notify the police or the air raid wardens."

### Physiologic Problems of Flying

In the House of Commons the air minister, Sir Archibald Sinclair, stated that in flying special attention was being paid to the problem of cold, to the supply of oxygen at high altitudes and to night vision. The development of aircraft tended toward flying at great heights, and research was continuous in search of a solution of the physiologic problems involved. The problem of cold was being tackled by the sealing up—a difficult problem in a fighting aircraft—and the heating of cabins and by the provision of equipment, boots, gloves, helmets and underclothing of special design. The psychologic care of pilots was not less important. The early detection of signs of flying strain formed an important part of the duties of medical officers of the air force. The fighting spirit of the pilots was so strong that unless they were closely watched they kept on flying long after they should have rested from operations. The medical officer's duty was to catch them in time, so that the squadron or station commander could make them rest. Good results had been achieved. The incidence of flying strain was considerably less than was expected before the war. The four orthopedic centers of the air ministry were second to none in the country today. Behind these were rehabilitation centers situated in the most healthful part of the country, at which modern methods were applied to secure recovery as quickly as possible. In addition, centers with the most modern forms of treatment for severe burns had been established.

### Science and the War Effort

Replying to a question in the House of Lords, Lord Hankey, chancellor of the duchy of Lancaster, said that scientific research in our war effort had three main pillars: the Department of Scientific and Industrial Research, the Medical Research Council and the Agricultural Research Council. The Scientific Advisory Committee to the government was in close touch through the Royal Society with the great streams of scientific research and development. The sphere of the Medical Research Council extended far beyond "medical" as this term was generally understood. It was concerned with all problems that affected man's health and efficiency and therefore assisted the defense department by promoting these in the men who operated machines such as aircraft and tanks. Research activities covered the whole field of the application of science to war. Among the subjects dealt with were the innumerable problems of the submarine, the submarine mine, the bomber and the fighter, their location by day and by night, in thick weather or in clear, the means of destroying them when located, and gas warfare in all its branches. Research in every item was being pursued systematically all over the country by an army of scientists. Our scientists were at least as good as those of the enemy.

With the aid of the scientific resources of the empire, and especially of the United States, we were building a scientific equipment destined to play an ever increasing part in our war effort.

### BUDAPEST

(From Our Regular Correspondent)

March 15, 1941.

### The Organization of Blood Donors

The Hungarian Red Cross Society started in the spring of 1940 to recruit blood donors. About six thousand women and girls have been supplied with printed matter, to wit, journal sheets of four colors corresponding to the blood group. On these sheets the result of clinical examination, the personal data of the donor, her short history and the respective blood group are recorded. To date only 1,955 women have been subjected to the different tests and of these 1,447 were found fit. The age of the applicants varied between 15 and 60 years. The Red Cross Society stated that in case of war the number of blood donors needed will be about ten thousand. Those who donate blood for saving wounded soldiers more than once will receive bronze medals as a special distinction, and they will be exempted from a part of the compulsory labor service that will be introduced in Hungary shortly; they will also enjoy priority if applying for any public position. In case of mobilization a certain contingent of women will be called in and their blood will be stored and taken to the front by airplanes. The stored blood will be kept for four weeks, and beyond this time it will not be used for transfusion.

### Prophylactic Inoculations Against Diphtheria

The ministry of internal affairs enacted the compulsory prophylactic inoculation against diphtheria of all children in their second year of life. The inoculations are made by the medical officers of health in towns and cities and by the district physicians in villages. The inoculations are made free of charge without regard to the financial position of the parents. No inoculations are made if there is medical evidence that the child has survived diphtheria or received within the last two years regular inoculation or if feverish or if suffering from an infectious disease, or if the body is much debilitated. With the same enactment the minister ordered the inoculation also of 7 year old children. These will be made in the schools by the school physicians.

### The Treatment of Cerebrospinal Meningitis with Sulfanilamide Preparations

At a recent meeting of the medical society Dr. Molitor gave an account of his experience gained in connection with 75 cases of cerebrospinal meningitis. In about 85 per cent of the cases the fever abated on the second or third day of treatment and the patients were out of bed on the fifth or sixth day of treatment. If oral administration was not feasible on account of vomiting, the drug was introduced anally through a catheter pushed up to the sigmoid. Improvement and cure were striking in almost all cases.

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## Marriages

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MONTGOMERY A. STUART, Captain, M. C., U. S. Navy, to Mrs. Charles Fague Williams at Annapolis, Md., April 26.

ROBERT A. DEMO, Rochester, N. Y., to Miss Vilma Arseneau of Campbellton, N. B., Canada, April 19.

JOHN F. KEARNS, Dutch Harbor, Alaska, to Miss Betty Merriam of Wallace, Idaho, April 14.

ROBERT PROSSER MORROW JR., New Orleans, to Miss Lelia Terry in Laurel, Miss., April 5.

CHARLES E. ERWAY, Rochester, N. Y., to Miss Edith Daugard of Syracuse, April 12.

## Deaths

**Albert Graeme Mitchell** \* Cincinnati; University of Pennsylvania School of Medicine, Philadelphia, 1910; chairman of the Section on Pediatrics of the American Medical Association, 1934-1935; instructor in pediatrics from 1919 to 1921 and associate in pediatrics from 1921 to 1924 at his alma mater; since 1924 B. K. Rachford professor of pediatrics at the University of Cincinnati College of Medicine; member of the American Pediatric Society, American Academy of Pediatrics and the Central Society for Clinical Research; past president of the Central States Pediatric Society and the Philadelphia Pediatric Society; in 1932 was elected a member of the National Board of Medical Examiners; member of the medical committee of the National Foundation for Infantile Paralysis; medical director of the Babies Milk Fund Association in Cincinnati; in 1929 member of the White House Conference on Child Health and Protection; delegate to the second International Congress of Pediatrics in Stockholm, Sweden, in 1930; in 1938 vice president of the Pan American Medical Association Section on Pediatrics 7th Cruise Congress; during the World War served as adjutant of Hospital Unit A, as superintendent and medical director of the American Hospital for Civilian Population at Neufchateau, France, with the 149th machine gun battalion of the 42d division in the San Michel and Argonne offensives, and with the Army of Occupation in Germany; was commissioned a major in the medical reserve corps in 1926; member of the city board of health from 1926 to 1930; director of pediatrics and contagious diseases, Cincinnati General Hospital; chief of staff and medical director of the Children's Hospital; director of the Children's Hospital Research Foundation; consulting pediatrician to the Ohio Soldiers' and Sailors' Orphan Home, Xenia; co-author with Dr. J. P. Crozer Griffith of Philadelphia of "Textbook of Diseases of Infants and Children," now known as the "Textbook of Pediatrics"; co-author of "Pediatrics and Pediatric Nursing"; a chief associate editor of "Cyclopedia of Medicine"; on the editorial board of the *American Journal of Diseases of Children*; aged 52; died, June 1.

**John Rosslyn Earp**, Albany, N. Y.; L.R.C.P., London, and M.R.C.S., England, 1917; was director of the health department of Antioch College, Yellow Springs, Ohio, from 1923 to 1927; lecturer at the University of Colorado, Denver, 1928-1929; director of public health of the state of New Mexico from 1931 to 1937; became associated with the New York State Department of Health in 1937, when he was appointed medical editor of the division of public health education; served with the British Red Cross, Belgium, 1914-1915 and medical officer of the French Red Cross, 1917-1918; was awarded the Mons medal and the Medaille de la Reconnaissance Française; member of the Medical Society of the State of New York; assistant editor of the *Lancet*, 1919; editor of *Tubercle*, 1919-1920; associate editor of the *International Journal of Public Health*, 1920-1922; scientific editor of *Colorado Medicine*, 1929-1930; member of the publications committee of *Public Health Nursing*; aged 49; died, May 19.

**Jacob Morgan Coffin** \* Colonel, United States Army, retired, San Francisco; University of Pennsylvania Department of Medicine, Philadelphia, 1900; entered the army as an assistant surgeon in 1902; at one time assistant professor of military science and tactics at his alma mater; served during the World War; was promoted through the various grades to that of colonel in 1928; retired in 1934 for disability in line of duty; aged 62; died, April 16, in the Letterman General Hospital of carcinoma of the tongue.

**Roderick Duncan Kennedy** \* Globe, Ariz.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1903; member of the House of Delegates of the American Medical Association, 1928-1929; past president of the Arizona State Medical Association and the Southwestern Medical and Surgical Association; fellow of the American College of Surgeons; on the staff of the Gila County Hospital; aged 62; died, March 19, in St. Joseph's Hospital, Phoenix, of coronary thrombosis.

**Arthur Storer Driscoll** \* Staten Island, N. Y.; Fordham University School of Medicine, New York, 1911; fellow of the American College of Surgeons; past president of the Richmond County Medical Society; served during the World War; member of the official advisory health preparedness committee; on the staffs of the Staten Island Hospital and the Richmond Memorial Hospital; aged 53; died, April 27.

**James Harvey Baldwin**, Baltimore; University of Pennsylvania Department of Medicine, Philadelphia, 1900; member of the Medical Society of the State of Pennsylvania; fellow of the American College of Surgeons; formerly on the staff of the Methodist Episcopal Hospital, Philadelphia; served during the World War; aged 69; died, April 18, in the Veterans Administration Facility, Coatesville, of arteriosclerosis.

**Patrick George McGill**, Superior, Wis.; School of Medicine and Surgery, Montreal, Que., Canada, 1890; member of the State Medical Society of Wisconsin; past president of the Douglas County Medical Society; formerly city health officer; served during the World War; aged 80; formerly on the staff of St. Mary's Hospital, where he died, April 23, of bronchopneumonia.

**Loring Bradford Packard**, Brockton, Mass.; Harvard Medical School, Boston, 1903; member of the Massachusetts Medical Society and the New England Roentgen Ray Society; on the staff and formerly superintendent of the Brockton Hospital; aged 63; died, April 12, in the New England Baptist Hospital, Boston, of hemorrhage resulting from aneurysm of the aorta.

**George Clinton Hafford** \* Albion, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1887; an Affiliate Fellow of the American Medical Association; fellow of the American College of Surgeons; served during the World War; formerly member of the school board; aged 78; died, April 19, in St. Petersburg, Fla., of coronary occlusion.

**Eugene Stephen Knox** \* Green Bay, Wis.; Marquette University School of Medicine, Milwaukee, 1914; past president and secretary of the Brown-Kewaunee-Door Counties Medical Society; served during the World War; formerly president of the staff of St. Mary's Hospital; aged 54; died, April 1, of streptococcal infection following an appendectomy.

**Arthur Henry Stall**, Akron, Ohio; Western Reserve University Medical Department, Cleveland, 1901; member of the American College of Radiology; past president of the Summit County Medical Society; served during the World War; formerly on the staff of the Akron City Hospital; aged 64; died, April 21, of carcinoma of the rectum.

**Horace Chauncey Lyman** \* Chicago; University of Illinois College of Medicine, Chicago, 1915; fellow of the American College of Surgeons; served during the World War; on the staffs of the Edgewater Hospital and the Alexian Brothers Hospital, Chicago, and the West Suburban Hospital, Oak Park, Ill.; aged 48; died, April 13.

**Michael Earley Murray Jr.**, Cambridge, Mass.; Harvard Medical School, Boston, 1932; member of the Massachusetts Medical Society; physician to the hygiene department, Harvard University; assistant in medicine, Massachusetts General Hospital, Boston; aged 36; died, April 21, in the McLean Hospital, Belmont.

**George William Kutscher Jr.**, Asheville, N. C.; University of Pittsburgh School of Medicine, 1923; member of the Medical Society of the State of North Carolina and the American Academy of Pediatrics; formerly secretary of the Buncombe County Medical Society; aged 44; died, April 15, in Philadelphia.

**Charles Gipson Dewey**, Boston; Dartmouth Medical School, Hanover, N. H., 1886; member of the Massachusetts Medical Society and of the American Psychiatric Association; assistant superintendent of the Boston City Hospital from 1895 to 1899; aged 80; died, April 19, of hypostatic pneumonia and myocarditis.

**Charles Henry Hall**, Brooklyn; Columbia University College of Physicians and Surgeons, New York, 1902; member of the Medical Society of the State of New York; at various times on the staffs of the Coney Island, Caledonian, Victory and Bay Ridge hospitals; aged 64; died, April 21, of cerebral thrombosis.

**George Johnson Tompkins**, Lynchburg, Va.; Medical College of Virginia, Richmond, 1894; member of the Medical Society of Virginia; on the staffs of the Lynchburg General Hospital, Marshall Lodge Memorial Hospital and the Virginia Baptist Hospital; aged 68; died, April 2, of heart disease.

**Greta Frankenberg**, Kew Gardens, N. Y.; Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin, Prussia, Germany, 1919; member of the Medical Society of the State of New York; on the staff of the Long Island College Hospital, Brooklyn; aged 45; died, April 25, of carcinoma.

**Lawrence Tweedie Sidwell**, Pomona, Calif.; University of Nebraska College of Medicine, Omaha, 1908; at one time superintendent of the Hospital for the Tuberculous, Kearney, Neb., and the Nebraska Institution for the Feeble-minded, Beatrice; aged 58; died, April 11, of heart disease.

**Farel Jouard** ☉ New York; New York Homeopathic Medical College and Flower Hospital, New York, 1918; on the staffs of the Mount Sinai Hospital, Polyclinic Hospital and the Gouverneur Hospital; aged 57; died, April 27, at his home in New Rochelle of lymphosarcoma.

**Mary H. Fletcher Perkins**, Steilacoom, Wash.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; member of the Washington State Medical Association; formerly on the staff of the Western State Hospital; Fort Steilacoom; aged 83; died, April 7.

**Ralph C. Matheny** ☉ Galesburg, Ill.; Northwestern University Medical School, Chicago, 1891; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; consulting oculist, Galesburg Hospital; aged 82; died, April 18.

**Rex Vale Henry**, Hedrick, Iowa; John A. Creighton Medical College, Omaha, 1901; member of the Iowa State Medical Society; served during the World War; aged 66; died, April 17, in St. Joseph Hospital, Ottumwa, of retroperitoneal tumor and volvulus and peritonitis.

**William Fritchey Roth**, Wilkes-Barre, Pa.; Hahnemann Medical College and Hospital of Philadelphia, 1894; member of the Medical Society of the State of Pennsylvania; on the staff of the Wyoming Valley Homeopathic Hospital; aged 69; died, April 1, of cerebral hemorrhage.

**Walter Branham Hendrick**, Hurtsboro, Ala.; University of Louisville (Ky.) Medical Department, 1890; member of the Medical Association of the State of Alabama; aged 72; died, April 21, in the City Hospital, Columbus, Ga., of cholecystitis and coronary heart disease.

**Peter Christian Heinrich Pahl**, Los Angeles; Bennett College of Eclectic Medicine and Surgery, Chicago, 1893; University of Southern California College of Medicine, Los Angeles, 1901; physician in charge and owner of a hospital bearing his name; aged 71; died, April 14.

**David Low**, Regina, Sask., Canada; McGill University Faculty of Medicine, Montreal, Que., 1889; past president of the Saskatchewan Medical Association and the Canadian Medical Association; member of the Saskatchewan Cancer Commission; aged 72; died, March 9.

**George William Overmeyer**, Retsil, Wash.; Curtis Physio-Medical Institute, Marion, Ind., 1888; Chicago Physio-Medical Institute, 1893; Hospital College of Medicine, Louisville, Ky., 1896; served during the World War; aged 78; died, April 5, of cerebral hemorrhage.

**A. E. McLarty**, Secaucus, N. J.; Western University Faculty of Medicine, London, Ont., Canada, 1909; served during the World War; on the staff of the Hudson County Hospital; aged 52; died, April 22, in the Medical Center of Jersey City of cerebral arteriosclerosis.

**William Marcus Kendall**, Beverly Hills, Calif.; Pulte Medical College, Cincinnati, 1892; formerly health officer, police surgeon and member of the board of education of Venice; aged 71; died, April 6, in the Hospital of the Good Samaritan of spontaneous pneumothorax.

**Griffith Moses Jones** ☉ Minneapolis; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; on the staff of the Norwegian Deaconess Hospital, aged 70; died, April 16, in Petersburg, Va., of coronary occlusion.

**Henry Louis Schelling**, Brooklyn; University of the City of New York Medical Department, 1890; member of the Medical Society of the State of New York; served during the World War; aged 75; died, April 13, in the Brooklyn Hospital of cerebral hemorrhage.

**Charles William Simpson**, Dallas, Texas; University of Tennessee Medical Department, Nashville, 1889; member of the State Medical Association of Texas; formerly medical director of the American Life Re-Insurance Company; aged 75, died, April 17.

**Homer Hopkinson Marks**, Berlin, N. H.; Medical School of Maine, Portland, 1906; member of the New Hampshire Medical Society; aged 65; on the staff of St. Louis Hospital, where he died, April 11, of injuries received when he fell down the elevator shaft.

**John Francis Hackett**, Waterbury, Conn.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1906; member of the Connecticut State Medical Society; served during the World War; aged 61; died, April 6, of coronary occlusion.

**Austin Rodgers Kracaw**, Denver; University of Colorado School of Medicine, Denver, 1911; member of the Colorado

State Medical Society; on the staffs of St. Joseph and Presbyterian hospitals; aged 54; died, April 4, of coronary thrombosis.

**William Edward Foy**, Fort Pierce, Fla.; Temple University School of Medicine, Philadelphia, 1933; member of the Florida Medical Association; on the staff of the Fort Pierce Memorial Hospital; aged 33; died, April 16, of coronary occlusion.

**Estie Eri Hunt**, Pendleton, Ind.; Indiana University School of Medicine, Indianapolis, 1926; at one time a member of the school board of Pendleton; aged 39; died, April 7, in the Indiana State Sanatorium, Rockville, of pulmonary tuberculosis.

**Farn Butt Chu** ☉ New York; Yale University School of Medicine, New Haven, Conn., 1930; aged 37; on the staffs of the Morrisania Hospital, Hospital for the Ruptured and Crippled and the Lenox Hill Hospital, where he died, April 19.

**Asa Kelly Shelton**, Oliver Springs, Tenn.; Vanderbilt University School of Medicine, Nashville, 1881; University of Nashville Medical Department, 1882; aged 84; died, April 7, in a hospital at Knoxville of carcinoma of the prostate.

**Herbert Willis**, Beach Haven, N. J.; Jefferson Medical College of Philadelphia, 1904; for many years mayor of Beach Haven, and county coroner; bank president; aged 59; died, April 8, of arteriosclerosis and cerebral hemorrhage.

**Oscar Elmer Hofmann**, West Hazleton, Pa.; Jefferson Medical College of Philadelphia, 1891; member of the Medical Society of the State of Pennsylvania; for many years school physician; aged 71; died, April 18, of heart disease.

**Arthur Burns** ☉ Houston, Texas; Johns Hopkins University School of Medicine, Baltimore, 1923; served during the World War; formerly director of the division of tuberculosis, state department of health; aged 44; died, April 8.

**Howard Roxboro Elliot** ☉ Grimsby, Ont., Canada; University of Toronto Faculty of Medicine, 1881; L.R.C.P. and L.R.C.S., Edinburgh, Scotland, 1881; member of the Colorado State Medical Society; aged 82; died, April 1.

**Libbie Seymour Cammack**, Maitland, Fla.; State University of Iowa College of Medicine, Iowa City, 1904; at one time a medical missionary; aged 64; died, April 5, in the Florida Sanitarium and Hospital, Orlando.

**Caroline Reed**, Veedersburg, Ind.; Northwestern University Woman's Medical School, Chicago, 1899; for many years on the staff of the Iola-Monroe County Tuberculosis Sanatorium, Rochester, N. Y.; aged 74; died, April 4.

**Merritt Owen Wilkins** ☉ Chicago; the General Medical College, Chicago, 1924; served during the World War; on the staff of the Illinois Masonic Hospital; aged 51; died, April 6, of coronary thrombosis and hypertension.

**James Franklin Hilton** ☉ Washington, D. C.; Georgetown University School of Medicine, Washington, 1904; aged 62; on the staff of the Georgetown Hospital, where he died, April 18, of carcinoma of the cecum.

**Warren Leroy Lindsay**, Salt Lake City; Rush Medical College, Chicago, 1917; served during the World War; on the staff of the Veterans Administration Facility; aged 57; died, April 16, of chronic nephritis.

**Arnold Burkelman**, Los Angeles; Bellevue Hospital Medical College, New York, 1891; member of the California Medical Association and the Pacific Coast Oto-Ophthalmological Society; aged 76; died, April 23.

**Samuel Wray Alexander**, McKenzie, Tenn.; University of Tennessee College of Medicine, Memphis, 1933; member of the Tennessee State Medical Association; aged 36; died, April 9, of coronary thrombosis.

**George Andrew Rigrish**, Charleston, W. Va.; Medical College of Ohio, Cincinnati, 1896; member of the West Virginia State Medical Association; aged 69; died, April 7, in the Kanawha Valley Hospital.

**David Oswald Foley** ☉ Mount Jackson, Va.; University of Maryland School of Medicine, Baltimore, 1896; aged 69; died, April 24, in the Rockingham Memorial Hospital, Harrisonburg, of angina pectoris.

**Curtis Lewis Hancock**, Lexington, Ky.; Hospital College of Medicine, Louisville, 1904; served during the World War; on the staff of the Veterans Administration; aged 57; died, April 20, of heart disease.

**Frank Herbert Low**, Santa Monica, Calif.; University of Pennsylvania School of Medicine, Philadelphia, 1929; member of the Utah State Medical Association; aged 44; died, March 30, in Salt Lake City.

Annie Luverne Harris, Richmond, Maine; Vanderbilt University School of Medicine, Nashville, Tenn., 1930; member of the Maine Medical Association; aged 38; was found murdered in March.

De Forrest Elmer Tiffany, San Jose, Calif.; State University of Iowa College of Homeopathic Medicine, Iowa City, 1893; member of the California Medical Association; aged 69; died, March 31.

Edgar Bond Armstrong, New York; Columbia University College of Physicians and Surgeons, New York, 1905; member of the Medical Society of the State of New York; aged 59; died, April 20.

David De Will Monerief, Atlanta, Ga.; Hospital Medical College, Atlanta, 1911; served during the World War; medical examiner of the Civil Aeronautics Administration; aged 64; died, April 11.

Joseph Luther Ewing, Shreveport, La.; Memphis (Tenn.) Hospital Medical College, 1911; member of the Louisiana State Medical Society; served during the World War; aged 54; died, March 28.

Frank Rudd McDonald @ Jersey City, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1917; served during the World War; aged 52; died, April 2, of coronary occlusion.

R. A. Creekmore, Calhoun City, Miss.; Louisville (Ky.) Medical College, 1894; Memphis (Tenn.) Hospital Medical College, 1895; aged 67; died, April 15, in the Baptist Hospital, Memphis.

Robert Washington King, Ackmen, Colo.; University of Colorado School of Medicine, Denver, 1912; aged 70; died, April 16, of coronary occlusion, arthritis, gangrene and acute nephritis.

J. Louis Fichman, Indianapolis; Indiana University School of Medicine, Indianapolis, 1929; member of the Indiana State Medical Association; aged 35; died, March 29, in the Methodist Hospital.

John Vassie Brown, Orillia, Ont., Canada; University of Toronto Faculty of Medicine, 1903; served during the World War; aged 64; died, April 8, in the Christie Street Hospital, Toronto.

John James Smith, Paris, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1879; Jefferson Medical College of Philadelphia, 1891; aged 87; died, April 4, of myocarditis.

Benjamin Damsky @ New York; Fordham University School of Medicine, New York, 1917; on the staff of the Mount Sinai Hospital; aged 48; died, April 24, of coronary occlusion.

Noah Gorsuch, Sunbury, Ohio; Columbus Medical College, 1892; member of the Ohio State Medical Association; aged 80; died, March 31, in the White Cross Hospital, Columbus.

John M. McClanahan, Guilford, Mo.; Missouri Medical College, St. Louis, 1886; aged 81; died, April 9, of valvular heart disease, diabetes mellitus and hypertrophy of the prostate.

George L. Perry, Portland, Ind.; Medical College of Indiana, Indianapolis, 1897; formerly county coroner and deputy coroner; aged 72; died, April 5, in the Jay County Hospital.

George Washington Heriot Jr., Roberta, Ga.; University of Georgia Medical Department, Augusta, 1928; aged 37; died, April 4, in Savannah of accidental morphine poisoning.

Charles Kahn @ Chicago; Northwestern University Medical School, Chicago, 1897; on the staff of the Englewood Hospital; aged 66; died, April 9, of coronary thrombosis.

William Francis Dryden, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1900; aged 69; died, March 29.

Edward O. Woodward, Martinsville, Va.; Meharry Medical College, Nashville, Tenn., 1897; aged 75; died, April 5, of acute pyelitis and carcinoma of the prostate.

Thomas Leo Mahony, Poughkeepsie, N. Y.; Long Island College Hospital, Brooklyn, 1907; aged 60; died, April 15, in the St. Francis Hospital of carcinoma.

Isaac Hall Emison, Russellville, Ark.; Vanderbilt University School of Medicine, Nashville, Tenn., 1888; aged 86; died, March 29, in San Antonio, Texas.

Laura Willis Cook Hann, Washington, N. J.; Woman's Medical College of Baltimore, 1892; aged 81; died, April 13, in Trenton, of cerebral arteriosclerosis.

Edward Thomas Kennedy @ Chicago; College of Medicine and Surgery, Chicago, 1905; aged 61; died, April 11, in the Edgewater Hospital of pneumonia.

Frank Means Johnston @ Tuskegee, Ala.; University of the South Medical Department, Sewanee, Tenn., 1900; aged 63; died, April 3, of cerebral hemorrhage.

W. E. Lebo, Gratz, Pa.; Medico-Chirurgical College of Philadelphia, 1897; aged 66; died, April 14, in the Harrisburg (Pa.) Hospital of nephrosclerosis.

John Moore Taylor @ Indianapolis; Indiana University School of Medicine, Indianapolis, 1921; aged 50; died, April 12, of a self-inflicted bullet wound.

William Andrew Haggard @ Miami, Fla.; University of Alabama School of Medicine, University, 1911; aged 56; died, April 3, of coronary sclerosis.

Fred Ernest Davis, Alvordton, Ohio; Toledo Medical College, 1904; formerly mayor of Alvordton; aged 70; died, April 14, of arteriosclerosis.

Henry James Millstone, Chicago; Rush Medical College, Chicago, 1916; aged 48; died, April 17, of an overdose of a drug, self administered.

Arlander Alonzo Barge, Newnan, Ga.; Atlanta Medical College, 1891; member of the Medical Association of Georgia; aged 80; died in April.

Tip Cox, Arabi, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1901; aged 61; died, April 4, of cerebral hemorrhage.

Harry Barton Hinchman @ Richmond, Va.; Medical College of Virginia, Richmond, 1916; aged 51; died, April 7, of coronary thrombosis.

William Monroe Edens, Estill Springs, Tenn.; University of Tennessee Medical Department, Nashville, 1890; aged 81; died, March 19.

Fred W. Cariker, Cushing, Texas; Tulane University of Louisiana School of Medicine, New Orleans, 1893; aged 69; died, April 16.

Samuel A. McConkey, Barboursville, W. Va.; Medical College of Virginia, Richmond, 1891; aged 76; died, April 8, of pneumonia.

Homer E. Songer, Kansas City, Mo.; Barnes Medical College, St. Louis, 1901; aged 65; died, April 1, of bronchopneumonia.

Ambert Young Easterwood, Ardmore, Okla.; University of Texas School of Medicine, Galveston, 1897; aged 69; died in March.

Percy C. Banghart, London, Ont., Canada; Western University Faculty of Medicine, London, 1905; aged 57; died, April 6.

Charles G. Holland, Greenville, Fla.; Louisville (Ky.) Medical College, 1891; aged 80; died, April 22, of diabetes mellitus.

Franklin English Michener, Tiffin, Ohio; Ohio Medical University, Columbus, 1898; aged 83; died, April 6, of angina pectoris.

George Noble Couch, Latham, Ill.; Bennett College of Eclectic Medicine and Surgery, Chicago, 1906; aged 65; died, April 7.

Robert Blake Tyler, Joplin, Mo.; Joplin College of Physicians and Surgeons, 1882; Civil War veteran; aged 87; died, April 2.

Margaret Doane Bigelow, Cincinnati; Laura Memorial Woman's Medical College, Cincinnati, 1899; aged 68; died in April.

Charles H. Beetem, Baltimore; Maryland Medical College, Baltimore, 1900; aged 71; died, April 13, of chronic nephritis.

Homer V. Hickman, Olney, Ill.; Barnes Medical College, St. Louis, 1901; aged 72; died, April 17, of bronchial asthma.

Eli Lewison, Canton, S. D.; Rush Medical College, Chicago, 1902; aged 66; died, April 6, of bronchopneumonia.

Austin R. Allen, Denver; Missouri Medical College, St. Louis, 1878; aged 84; died, April 9, of arteriosclerosis.

Henry F. Rhodes, Philadelphia, Mo.; Jefferson Medical College of Philadelphia, 1883; aged 82; died, April 5.

Harry B. Andrew @ New Salem, Ill.; Missouri Medical College, St. Louis, 1896; aged 68; died, April 5.

Julian Howard Herndon, Milcs, Texas; Louisville (Ky.) Medical College, 1904; aged 63; died, April 16.

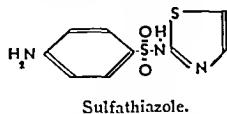
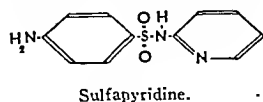
James E. Wyatt, Prairie Point, Miss.; Louisville (Ky.) Medical College, 1883; aged 85; died, March 17.

Gaetano Ronga, Chicago (licensed in Illinois in 1899); aged 66; died, April 6.

## Correspondence

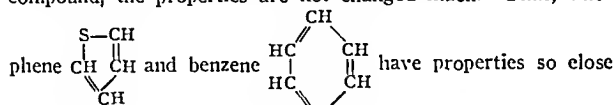
### STRUCTURAL RELATIONSHIPS OF SULFAPYRIDINE AND SULFATHIAZOLE

*To the Editor:*—An explanation for the efficacy of sulfapyridine and sulfathiazole which I have not seen in print is suggested by an examination of their structural formulas:

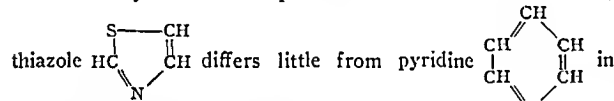


Now, sulfapyridine differs from the parent sulfanilamide by having a pyridine nucleus attached to the amido group. This pyridine nucleus is present in the quinoline alkaloids, such as quinine, and also in the synthetic ethyl hydrocupreine hydrochloride. These are toxic to pneumococci, and the effectiveness of sulfapyridine may possibly be due in some measure to the added pyridine nucleus.

If sulfur is substituted for an ethylene linkage in a cyclic compound, the properties are not changed much. Thus, thio-



that it is very difficult to separate them. In the same fashion,



chemical and physical properties.

Thus, one would expect sulfathiazole to have about the same chemical properties, and therefore pharmacologic action, as sulfapyridine. It is known (Fränkel, Sigmund: *Arzneimittelsynthese*, ed. 5, Berlin, Julius Springer, 1921, p. 109) that the presence of cyclically bound sulfur in a compound exerts a "resorptive" effect similar to that of the iodides, and in a disease such as pneumonia, which is characterized by a strong exudative process, it may be that sulfathiazole exerts a beneficial effect by stimulating the resorption of the exudate.

This reasoning is by no means rigorous, but it does suggest lines of investigation with these new drugs.

EMANUEL M. ABRAHAMSON, M.D., Brooklyn.

### MEDICAL FAMILIES

*To the Editor:*—I noticed in THE JOURNAL, May 3, page 2102, a short report from Dr. J. P. Sharon about a medical family that he knew, with their names and relationships. Although some of them are dentists, there are a number of M.D.'s among them. This report aroused my interest enough to enclose the bookplate that I had designed for my son's graduation in 1938 at Johns Hopkins. He is the seventh doctor in my family, all of whom have practiced in Baltimore in an unbroken line. He is the fourth Ferdinand. I have all the diplomas of my forebears, including those of my uncle S. M. C. and of my brother F. E. C. III, who did not live long enough to practice but died a month after graduation. My uncle after starting in medicine went into the priesthood and later became the Bishop of Indianapolis.

The reason I have Haiti on the bookplate is that the family was driven out at the time of the insurrection and settled in Baltimore.

J. A. CHATARD, M.D., Baltimore.

### VARICELLA AND HERPES ZOSTER

*To the Editor:*—In the discussion of the relationship of varicella to herpes zoster, so much importance has been in the past attached to the report of Cantor (*Brit. M. J.* 2:508, 1921) on the complete absence of varicella from a small island in the Straits Settlements on which zoster not uncommonly occurred that the following letter is of scientific as well as historical interest:

Christmas Island  
Straits Settlements  
April 3, 1941

Dear Dr. Rosenberg:

Replying to your letter of January 20, 1941, I am afraid Christmas Island lost its only claim to distinction in 1933 when 4 people, all old residents on the island, were diagnosed as suffering from varicella. Again in 1940 there was 1 case. With regards to herpes zoster, I can only find 1 case recorded. This occurred in 1936.

Trusting this information will be satisfactory,

Yours very truly,

J. SCOTT CLARK, M.B., Ch.B.,  
Medical Officer, Christmas Island  
Phosphate Company, Ltd.

JACOB ROSENBERG, M.D., Brooklyn.

### THIAMINE OVERDOSAGE

*To the Editor:*—In a communication on thiamine overdosage and toxicity in THE JOURNAL, May 3, Dr. Clarence A. Mills, professor of experimental medicine of the University of Cincinnati College of Medicine, stressed the importance of the recognition of symptoms of overdosage of thiamine and the possible danger of the addition of thiamine hydrochloride to bread and other commonly used foods without control over the intake level. He wrote: "Just why no reports of thiamine toxicity have appeared in medical literature is difficult to understand, for the vitamin has been widely used at daily intake levels of 10 to 50 mg. in treatment of deficiency states." I called attention to the untoward effects resulting from the use of continuous and large doses of thiamine as early as December 1938 in the *American Journal of Digestive Diseases*. The importance of irritation of the peripheral nerves resulting in herpetiform lesions was described.

CHARLES LEROY STEINBERG, M.D., Rochester, N. Y.

### TRANSFUSION OF PLASMA

*To the Editor:*—Transfusion either of whole or of modified blood is a widely used and highly successful therapeutic procedure. It is therefore important that any attendant catastrophe be most carefully analyzed. For this reason I wish to call attention to some errors contained in the report "Death from Transfusion of Plasma" by Dr. Frank Mayner, Wyandotte, Mich. (THE JOURNAL, May 3, p. 1515).

The subject of this report was in my service in the Wyandotte General Hospital. I also cared for his elder brother when he was hospitalized with the same illness. Contrary to the statement in the report, the elder brother recovered and today is alive and well.

The statement that the patient had been given a transfusion of whole blood is also in error. The patient had had no transfusion before the plasma transfusion that was given immediately prior to his death. Therefore there could have been no question of an induced sensitivity because of a previous transfusion.

This case record and the section of lung kindly lent by Dr. Mayner have been reviewed by Dr. Warren B. Cooksey of Detroit with Dr. Armand Quick of Milwaukee and Dr. Max Strumia of Bryn Mawr, Pa. They reached the conclusion that the emboli of fibrin found only in the capillary system of the lungs came preformed from the donor's unfiltered plasma rather than having been formed after this plasma was introduced into the recipient's circulatory system.



It is well known that properly prepared plasma on standing may coagulate and form minute masses of fibrin which are potential emboli. It follows that all plasma before being administered intravenously should be filtered. This was not done in the case under discussion and undoubtedly accounts for the presence of fibrin plugs demonstrated only in the lesser circulation.

J. HUGH LEWIS, M.D., Wyandotte, Mich.

## Medical Examinations and Licensure

### COMING EXAMINATIONS

#### BOARDS OF MEDICAL EXAMINERS

##### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in *THE JOURNAL*, June 7, page 2618.

#### NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, June 23-25. Part III. Various centers, June or July. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

#### EXAMINING BOARDS IN SPECIALTIES

AMERICAN BOARD OF ANESTHESIOLOGY: *Written. Part I.* Various centers, Nov. 1. Final date for filing application is Aug. 4. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written.* Nov. 3. Final date for filing application is Sept. 23. *Oral.* Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written. Part I. Group B.* Jan. 3. *Oral. Part II. Groups A and B.* Atlantic City, May or June. Final date for filing application is 90 days in advance of the examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Portland, July 15; Chicago, Oct. 18. *Written.* March 7, 1942. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 1640 State St., New Orleans, La.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 16-18. Final date for filing application is July 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: *Oral.* Boston, Oct. 7-8, immediately following the annual meeting of the American Academy of Pediatrics. *Written.* Locally, Aug. 22. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral.* New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: *Oral. All groups.* Cincinnati, Sept. 19-21. Final date for filing application is Aug. 1. Sec., Dr. Byrl R. Kirklind, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF UROLOGY: Chicago, February. Final date for filing application is three months before date of examination. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

### Hawaii January Report

The Board of Medical Examiners of the Territory of Hawaii reports the written examination for medical licensure held at Honolulu, Jan. 13-16, 1941. The examination covered 10 subjects and included 80 questions. An average of 75 per cent was required to pass. Six candidates were examined, 5 of whom passed and 1 failed. Two physicians were licensed to practice medicine by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine.....	(1939)	78	
University of Illinois College of Medicine.....	(1939)	91	
Tulane University of Louisiana School of Medicine....	(1939)	77.4	
Cornell University Medical College.....	(1939)	86	
University of Oregon Medical School.....	(1939)	80	

School	FAILED	Year Grad.
Creighton University School of Medicine.....	(1936)	

School	LICENSED BY ENDORSEMENT	Year Grad.
Harvard Medical School.....	(1937)	
Vanderbilt University School of Medicine.....	(1931)	

### Colorado April Report

The Colorado State Board of Medical Examiners reports the written examination for medical licensure held at Denver, April 2-4, 1941. The examination covered 8 subjects and included 68 questions. An average of 75 per cent was required to pass. Five candidates were examined, all of whom passed. Two physicians were licensed to practice medicine by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Loyola University School of Medicine.....	(1941)	82	
Northwestern University Medical School.....	(1941)	87.8	
Rush Medical College .....	(1939)	80.5	
University of Oklahoma School of Medicine.....	(1940)	86	
University of Wisconsin Medical School.....	(1940)	89.8	

School	LICENSED BY ENDORSEMENT	Year Endorsement Grad. of
University of Kansas School of Medicine.....	(1934)	Kansas
University of Nebraska College of Medicine.....	(1934)	Nebraska

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Malpractice: Liability of Physician for Patient's Injury from Fall in Treatment Room.**—The defendant physician treated the plaintiff in his office, the treatment consisting of the application of a phenol solution to the cervix of the uterus. On completion of the treatment he told her, according to his testimony, to remain on the treatment table until she felt all right. He then left the room. The patient apparently immediately got off the table, became nauseated, fainted and fell against a hot radiator, sustaining a burn. In a subsequent suit against the physician and the corporation that owned the building in which the physician's office was located, the patient contended that the physician was negligent in permitting her to remain unattended following the treatment, in keeping the treatment room extremely hot and in leaving the radiator unprotected. At the close of the plaintiff's evidence, the trial court dismissed the case and the plaintiff appealed to the Supreme Court of Washington.

With respect to the corporate owner of the building, the Supreme Court said that its stock was held primarily by physicians having offices in the building and that the defendant physician owned some twenty-two shares of the corporation's five hundred shares. The defendant paid rent as a tenant to the corporation but the corporation in no way shared in his earnings. Clearly, the court said, the plaintiff made no case against the corporation and the judgment of dismissal as to it was proper.

The defendant physician, called as an adverse witness by the plaintiff, testified that in most physicians' offices in the locality the radiators used to heat them were not protected by a covering and that the treatment table used at the time of the accident was of the type customarily used. He estimated that the temperature of the room at the time of the plaintiff's treatment was between 75 and 80 F., explaining that the room was customarily kept quite warm because of the fact that many of the patients remove their clothing before undergoing treatment. He further testified that the treatment room and its equipment was of the type customarily used in the average physician's office in the community and that the treatment administered to the plaintiff was quite common and that there was nothing about it that the average physician considered as likely to cause a patient to faint. He further said that ordinarily a nurse would not remain in the room after the treatment was administered.

It was the opinion of the Supreme Court that negligence cannot be predicated on the manner in which the treatment room was equipped nor on the presence of the hot radiator. The immediate cause of the accident was the fainting of the patient; the presence of the radiator was but a condition. Falling in a faint, the patient might have sustained injuries in other ways.

by striking her head on the floor or against some other object in the room. Since negligence is not to be presumed, the question resolved itself into whether the evidence produced by the plaintiff, in itself, or in the reasonable inference to be drawn from it, would warrant a finding of negligence by the jury predicated on the defendant's failure to have some one in attendance on the patient after administration of the treatment. The plaintiff in her complaint set out the standard by which the defendant's professional conduct was to be measured, namely "the usual practice in like cases in this locality and similar communities." Other than the testimony of the defendant, however, the plaintiff produced no evidence whatever as to what was the usual practice in like cases in the locality. The trial court dismissed the case on the ground that, in the absence of the testimony of qualified practitioners, the jury could only speculate as to what the defendant should have done under the circumstances. The plaintiff produced neither medical nor lay testimony on this issue and the Supreme Court felt that the trial court was justified in dismissing the case. The judgment of dismissal was therefore affirmed.—*Hoover v. Goss et al*, 97 P. (2d) 689 (Wash., 1940).

**Medical Practice Acts: Constitutionality Not Affected by Exemption of Faith Healers.**—Max A. Vogel, a naturopath, was convicted of violating the medical practice act of Texas and appealed to the court of criminal appeals of Texas. While he had no license to practice medicine, Vogel possessed a "certificate" issued by the Naturopathic Association of Texas, a corporation, which at one time was filed for record with the clerk of the county court of Bexar County, Texas. The registration of that certificate, however, was canceled by court order in July 1937.

During the argument to the jury in the present case the district attorney stated that the defendant should have known that he was required to have a license to practice medicine because many members of the Naturopathic Association of Texas had had their registered certificates eliminated from the records in a court action brought by the attorney general. At the time that this statement was made, the district attorney held in his hand a medical register, many sheets of which had not been offered in evidence. The defendant contended that this argument was improper because it had no support in the evidence. The record showed, however, that there had been introduced in evidence, without objection from the defendant, a petition against the district clerk of Bexar County praying that he be ordered to strike from the records of his office the naturopathic certificates. It was further shown that the prayer was granted and that the registration of defendant was among those eliminated from the medical register. In view of that evidence, the court thought that the argument of the district attorney was warranted and proper.

The court likewise overruled the defendant's contention that the medical practice act, by exempting from its terms those applying the "principles, tenets, or teachings of any church in ministering to the sick or suffering by prayer, without the use of any drug or material remedy," was discriminatory and therefore unconstitutional. The court could find no reversible error in the record and the judgment of conviction was affirmed.—*Vogel v. State*, 137 S. W. (2d) 1043 (Texas, 1940).

**Advertising Baker's "Cancer Cure" by Mail Constitutes Use of Mails to Defraud.**—In 1929 Norman Baker, who at that time was a grocery merchant, learned that a Dr. Ozias in Kansas City had discovered a hypodermic treatment reputed to cure patients suffering from cancer. Baker selected 5 test patients who had cancer and sent them to Dr. Ozias for treatment. After these patients had been treated by Dr. Ozias, Baker announced over a radio station which he owned and in a magazine which he published that a cure for cancer had been discovered. All the test patients subsequently died from cancer, but Baker continued to advertise, by means of radio, magazines, letters, pamphlets and the like, the false claim that he had discovered and perfected a sure cure for that

disease. "Dr. Ozias did not give Baker his formula for treatment of cancer, but two persons in his employ went to work for Baker." In the advertisements disseminated by Baker and his associates Bellows and Statler, persons suffering from cancer, including those in the last stages of the disease, were urged to visit either the Baker Hospital at Eureka Springs, Ark., or the Baker Institute at Muscatine, Iowa. They promised that the period of treatment at these institutions was short and the fee small, and if the patient was not cured on his first visit he would be given further treatments free of charge. Their propaganda also contained the statement that surgical operations, roentgen and radium treatments and all other remedies and treatments recommended by members of the American Medical Association would not and could not in any event cure cancer but that Baker had discovered and perfected "a sure cure" for the disease. They claimed that many persons who had been given up to die by members of the regular medical profession had been cured of cancer by Baker's method. Baker and his associates were subsequently indicted for violation of the United States postal laws (U. S. Criminal Code, Section 215; 18 U. S. C. A., Section 338) in that they used the United States mails in the perpetration of a scheme to defraud and to obtain money and property by means of false pretenses and representations. The defendant Baker did not testify in his own behalf. From a judgment of conviction the defendants appealed to the United States circuit court of appeals, eighth circuit.

The defendants first contended that the indictment under which they were convicted was insufficient because it failed to allege that any person induced to visit the Baker hospitals was also induced by fraud to part with some money or property of value. The circuit court of appeals held that the gist of the defendants' offense was the use of the mails to defraud and that it was quite immaterial whether the scheme was successful or unsuccessful. The defendants also contended that the letters and other material, including a package of salve, mailed by them did not carry out the fraudulent scheme. The court, however, held that these letters, which referred to the treatments performed or advised by the defendants and contained statements promoting the Baker hospitals and the Baker "cure," had such a relation to the fraudulent scheme as to aid in its execution.

The court could not agree with the defendants' contention that the trial court had erred in refusing to receive in evidence three reels of motion pictures purporting to show the treatment and progress of patients in the Baker hospitals. These pictures, said the court, were properly excluded because no proper foundation had been laid for their admission and there was nothing in them which could not have been better proved by oral testimony.

The defendants further contended that the evidence was insufficient to sustain the verdict of guilty. They admitted that they had advertised that treatment by the use of surgery, roentgen rays and radium and other methods of treatment recommended and used by members of the American Medical Association would not and could not in any event cure cancer and that Baker's method was "a sure cure" for that disease, but they insisted that such statement was at best a mere matter of opinion. There was, said the court, substantial evidence by eminent experts that the proper method of treating cancer is by the use of surgery, roentgen rays and radium. Conceding that the defendants could honestly have entertained an opinion as to the efficiency of some or all of the methods of treating cancer, the falsity of the defendants' statement appears from the use of the supposedly fair difference of opinion as a step in assuring the public that in contrast Baker had discovered and perfected "a sure cure" for cancer. While there may be an honest difference of opinion as to the value and efficacy of the use of a certain medicine or a certain curative practice, what is advanced as a difference of opinion cannot be used as a device to deceive or as a step so wanting in basis that it must be denounced as a fraudulent misrepresentation. The

court could not agree with the defendants' insistence that there was no proof that fake examinations had been made at the Baker hospitals as was charged in the indictment. According to the evidence, continued the court, many patients were admitted but many received only superficial treatment at best. An untrained or practical nurse gave treatments consisting of colonic and vaginal packs which should be given only by or under the direction of a physician. There were no microscopes in the hospitals and no pathologic examination or study was attempted. A physician who had been employed at the Baker hospital testified that there was no way of determining for certain whether or not patients had cancer. The chief of staff at the Baker Hospital, Beatty, testified that he detected cancer by "palpation, feeling of it and guessing whether the patient had it or not." One of the defendants, Statler, testified that he "judged cancer from looking at the patient." There was also evidence that the examination of patients consisted of "pinching them and looking at them." Two eclectic physicians who had been employed at one or the other of the Baker hospitals for various periods between 1937 and 1938 testified that they had given the same hypodermic injections, numbers 4 and 5, to all patients but that they did not know the composition of the solutions injected. According to the evidence, injection number 4 contained hydrochloric acid 0.18 of 1 per cent, salt 0.03 per cent, a trace of phosphate and the rest water, while injection number 5 contained glycerin 25.53 per cent, carbolic acid 28.4 per cent and the balance alcohol. Eminent experts testified that the remedies used by the defendants "would not effect a cure for cancer nor do any good to anything." The circuit court of appeals concluded, therefore, that there was abundant evidence of the defendants' lack of good faith. The court also believed that the conduct of the district attorney in making certain remarks about one of defendants' witnesses was unethical and reprehensible but not prejudicial, as the defendants contended. Accordingly, the circuit court of appeals affirmed the judgment of conviction. Defendants' petitions for a writ of certiorari and for a rehearing were denied by the United States Supreme Court.—*Baker et al. v. United States*, 115 F. (2d) 533 (1940); 61 S. Ct. 711 (1941); 61 S. Ct. 731 (1941).

**Hospitals, Governmental: Right to Exclude Osteopaths.**—By a special act of the Florida legislature, the city commissioners of Miami were authorized to establish and operate the Jackson Memorial Hospital and to create a board of trustees for the management of the institution. Pursuant to its power to establish by-laws, rules and regulations, the board adopted a rule providing that only legally licensed physicians who were graduates of class A medical schools, with an M.D. degree and eligible for membership in the Dade County Medical Association should be admitted to practice in the hospital. As a result of the enforcement of this rule the plaintiff, an osteopath, was denied the privilege of entering the hospital and caring for one of his patients. He thereupon petitioned the circuit court, Dade County, for an order to restrain the enforcement of the board's rule. From a judgment against him, the plaintiff appealed to the Supreme Court of Florida.

The plaintiff first contended that an osteopath has a constitutional right to practice his profession in a tax-supported institution and that the rule denying that right was therefore unconstitutional and discriminatory. The Supreme Court held that this contention had already been disposed of in two prior cases the facts of which were substantially the same as in this case. In the first of these, *Hayman v. City of Galveston*, 273 U. S. 414, 47 S. Ct. 363 (J. A. M. A. 89:234 [July 16] 1927), the Supreme Court of the United States said that some choice in methods of treatment in a hospital was inevitable and that it was neither unreasonable nor arbitrary to exclude the devotees of some of the numerous systems or methods of treatment of the sick. Furthermore, said the United States Supreme Court, no practitioner has a constitutional right to practice his profession in a publicly supported institution. A state is not

required to maintain a hospital for the private practice of medicine. In the other case, *Newton v. Board of Commissioners of Weld County*, 86 Colo. 446, 282 P. 1068 (J. A. M. A. 95:366 [Aug. 2] 1929), the Supreme Court of Colorado similarly held that "a regulation excluding from the county hospital, or the right to practice therein, the devotees of some of the numerous systems or methods of treating diseases authorized to practice the profession in Colorado is neither unreasonable nor arbitrary. Some choice of methods necessarily exists, and we cannot say that in the case at bar the county board of commissioners did not have an adequate basis for its resolution. Neither can we say that this resolution was not justified upon the ground, which abundantly appears from this record, that, if the right to practice in the county hospitals is open to all the different schools of medicine, there would be constant jealousies and dissatisfactions between the rival schools of medicine which probably might or would greatly lessen the usefulness of the public hospital. The court cannot substitute its judgment for that of the county board. . . ."

The plaintiff further contended that the Florida osteopathic practice act clearly disclosed a legislative intent that osteopaths and doctors of medicine should have equal rights and privileges so far as public institutions were concerned, referring particularly to section 13 of that act which provides that "Osteopathic Physicians and Surgeons licensed hereunder shall have the same rights as physicians and surgeons of other schools of medicine with respect to the treatment of cases or holding of offices in public institutions." In answering this contention the court said, in part:

We encounter but little, if any, difficulty in construing Chapter 12287 [the osteopathic act]. We find the intention of the Legislature free from doubt and the object to be accomplished in its enactment is free from ambiguity. The expression "treatment of cases" is an authority, right and privilege granted to osteopathic physicians and surgeons, after completing the course of study prescribed by law and successfully passing the prescribed examination, and by the Board of Osteopathic Medical Examiners granted a license to practice as set forth in Section 11 of the Act.

The expression in the Act that osteopathic physicians and surgeons licensed thereunder shall have the same rights as physicians and surgeons of other schools of medicine with respect to the treatment of cases or "holding of offices in public institutions" cannot be construed to mean that patients of osteopathic physicians can be granted the rights and facilities of municipal hospitals, but the "holding of [public] offices in public institutions" may be construed to mean that osteopathic physicians are legally eligible to hold office in public institutions when appointed or elected. An examination of the title of the Act, as well as the body, considered in its entirety, fails to show a legislative intent to authorize osteopathic physicians and surgeons to practice in or have all the rights and facilities of a municipal hospital extended as a matter of law to their patients. The Act as a whole is applicable to osteopathic medicine; it provides for a course of study and a Board whose duty it is to hold examinations and license those eligible to practice. We are unable to read into the Act the contentions here made on the part of counsel for appellant that osteopathic physicians can practice in and have the right and facilities of a municipal hospital extended to their patients.

The judgment of the trial court denying to the osteopath the relief sought was affirmed.—*Richardson v. City of Miami et al.*, 198 So. 51 (Fla. 1940).

## Society Proceedings

### COMING MEETINGS

- American Association on Mental Deficiency, Salt Lake City, June 20-24. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
- American Laryngological, Rhinological and Otological Society, Los Angeles, June 16-18. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.
- American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.
- Idaho State Medical Association, Sun Valley, June 18-21. Dr. F. B. Jeppesen, 105 North 8th St., Boise, Secretary.
- Maine Medical Association, York Harbor, June 22-24. Dr. Frederick B. Carter, 22 Arsenal St., Portland, Secretary.
- Montana Medical Association of Great Falls, June 24-26. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.
- Pacific Northwest Medical Association, Spokane, Wash., June 25-28. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### American Journal of Physiology, Baltimore

132:311-570 (March) 1941. Partial Index

- Coronary Reflex Dilatations Accompanying Contractions of Voluntary Muscles. C. W. Greene.—p. 321.
- Presence and Distribution of Histamine in Blood. D. Minard, Chicago.—p. 327.
- Biochemical Characteristics of Denervated Skeletal Muscle, at Rest and After Direct Stimulation. R. Levine, O. Hechter and S. Soskin, Chicago.—p. 336.
- Magnitude and Time of Development of Collateral Circulation in Occluded Femoral, Carotid and Coronary Arteries. R. W. Eckstein, D. E. Gregg and W. H. Pritchard, Cleveland.—p. 351.
- Pattern of Serum Proteins During Accelerated Growth. E. S. Zawadzki and A. H. Smith, Detroit.—p. 362.
- Effect of Bile Acids on Hepatic Blood Flow. F. S. Grodins, S. L. Osborne, A. C. Ivy and L. Goldman, Chicago.—p. 375.
- Training in Human Muscles Working With and Without Blood Supply. G. L. Maisson and A. G. Broecker, St. Louis.—p. 390.
- Relationship of Plasma Volume and Cell Plasma Ratio to Total Red Cell Volume. E. A. Stead Jr. and R. V. Ebert, Boston.—p. 411.
- Effect of Hypoxemia on Ventilation and Circulation in Man. E. Asmussen and H. Chiodi, Boston.—p. 426.
- Comparative Effects of Progesterone and Corticoadrenal Extracts on Normal, Adrenalectomized and Other Animals. E. L. Corey, with technical assistance of R. Kline, Charlottesville, Va.—p. 446.
- Measurement of Blood Flow of Liver. J. H. Grindlay, J. F. Herrick and F. C. Mann, Rochester, Minn.—p. 489.
- Observations on Water Intake in Adult Man with Dysfunctioning Salivary Glands. F. R. Steggerda, Urbana, Ill.—p. 517.
- Circulation in Rest and Work on Mount Evans (4,300 Meters). E. Asmussen and F. C. Consolazio, Boston.—p. 555.

#### American Journal of Surgery, New York

51:553-852 (March) 1941. Partial Index

- Treatment of Fresh Wounds. P. H. Kreuscher, Chicago.—p. 573.
- \*Use of Bipp and Liquid Paraffin in Treatment of Wounds. F. B. Gurd and Laurie H. McKim, Montreal.—p. 584.
- Fifteen Years of Tannic Acid Method of Burn Treatment. D. M. Glover and A. F. Sydow, Cleveland.—p. 601.
- Traction Paralysis of Brachial Plexus. A. Kolodny, New York.—p. 620.
- Diagnosis and Treatment of Post-Traumatic Osteoporosis. L. G. Herrmann and J. A. Caldwell, Cincinnati.—p. 630.
- \*Possible Etiologic Relationship Between Single Trauma and Malignant Tumor. H. H. Davis, Omaha.—p. 641.
- Preservation of Tendon Function by Use of Skin Flaps. E. A. Kitlowski, Baltimore.—p. 653.
- Avulsion of Lower Biceps Brachii Tendon: Analysis of Fifty-One Previously Unreported Cases. R. P. Dohbie, Buffalo.—p. 662.
- Pathologic Changes Induced in Tendons Through Trauma and Their Accompanying Clinical Phenomena. N. J. Howard, San Francisco.—p. 689.
- Some Observations on Fractures of Long Bones in Children. F. Beckman and J. E. Sullivan, New York.—p. 722.
- Low Back Pain and Trauma. H. E. Mock, Chicago.—p. 779.
- Our Changing Ideas Concerning Protrusion of Intervertebral Disks. J. Raaf, Portland, Ore.—p. 803.
- Compatibility Factor in Transfusion of Blood. A. L. Cameron, Minot, N. D.—p. 821.
- Severe Injuries of Face and Jaws. E. C. Padgett, Kansas City, Mo.—p. 829.

#### Bismuth Paste and Liquid Petrolatum for Wounds.

—Gurd and McKim point out that the bismuth iodoform petrolatum paste (bipp) method of treating wounds is again gaining importance. After twenty-three years of use they are convinced that the method may be safely and effectively used for the following types of wounds: 1. Acute traumatic lesions whether due to gunshot wounds, automobile injuries or construction accidents associated with potential infection and particularly with compound fractures. In less severe wounds a complete primary closure may be done occasionally. However, a delayed primary closure is nearly always advisable. When loss of tissue is so extensive so that delayed primary suture is impossible, or when moderate infection exists, secondary suture or various plastic procedures for filling the defects may be utilized. 2. Infected wounds which may have resulted from

untreated trauma or infection of operating wounds. The method is also efficacious as a prophylactic measure against infection of the wall of the body when certain infected cavities (abdominal, appendical or pulmonary abscesses, empyema and operations on the mastoid or other deep seated abscesses) are opened. The bismuth iodoform petrolatum paste method is similar (mechanical cleansing, application of an antiseptic and immobilization) to the Winnett-Orr method. However, it differs in that the iodine as used by Orr will be absorbed in a short time and no further supply will be available, but the use of bipp results in a continuous supply of nascent iodine to the tissues as long as the paste is present in the wound. The material inhibits bacterial growth and liberates small amounts of iodine over a long period. The paste is composed of one part of bismuth subnitrate with two parts of iodoform (powder) and sufficient liquid petrolatum to form a paste.

**Single Trauma and Malignant Tumor.**—Davis states that a single injury to previously healthy tissue has never been definitely proved to cause cancer, but a single trauma may reveal a malignant growth. No one has succeeded in experimentally producing malignant tumors by trauma alone. The element of chance may account for the incidence of trauma in a few cases in which cancer developed. The general impression of those who have studied large numbers of injured people (war injuries) is that there is no increase of cancer among them in comparison to those who have not sustained single injuries. In individual instances it may not be possible to disprove absolutely the etiologic relationship. To consider trauma as a cause, the following must be fulfilled: (1) the authenticity of the trauma, (2) the adequacy of the trauma, (3) the origin of the tumor at the injury, (4) the previous integrity of the injured part, (5) a reasonable time limit between the injury and the appearance of the tumor and (6) the positive diagnosis of the presence and type of the tumor.

#### Am. J. Syphilis, Gonorrhea and Ven. Dis., St. Louis

25:133-264 (March) 1941

- Blood Cells in Early Syphilis. U. J. Wile, R. Isaacs and C. W. Knerler, Ann Arbor, Mich.—p. 133.
- Modern Possibilities of Gonorrhea Control. R. Deakin and M. Wortman, St. Louis.—p. 142.
- Effect of Temperature on Kahn Reaction: Parts I to IV. R. L. Kahn, E. B. McDermott and S. Marcus, Ann Arbor, Mich.—p. 151.
- Possible Presence of Reagin-like Factor in Normal Human Serum. N. P. Sherwood, G. C. Bond and R. I. Canuteson, Lawrence, Kan.—p. 179.
- Microscopic Slide Modification of Eagle and Kahn Flocculation Tests for Syphilis. J. H. Strauss, Baltimore.—p. 186.
- Etiologic Considerations in Postarsphenamine Dermatitis. F. E. Cormia, Montreal, Canada.—p. 189.
- \*Reinfection in Congenital Syphilis. R. D. Hahn, Baltimore.—p. 200.
- Factors Affecting Results of Contact Investigation in the Syphilis Clinic of the Johns Hopkins Hospital. R. Dyar, Stockton, Calif., and N. W. Guthrie, Los Angeles.—p. 215.
- Cutaneous Toxicity of Mapharsen. E. Epstein, Oakland, Calif.—p. 225.
- Factors Influencing Course of Syphilis. II. J. Morgan, Nashville, Tenn.—p. 233.

**Reinfection in Congenital Syphilis.**—Hahn reviews the probable cases of reinfection in congenital syphilis reported in the literature. The review indicates that no definite clinical entity of reinfection in congenital syphilis has been established. In the earlier reports the diagnosis of congenital and acquired infections, of necessity, had to be inferred from clinical appearances alone. More recently workers have conformed to adequate criteria for demonstrating the acquired infection, but for evidence of prior congenital syphilis they contented themselves with the acceptance of more or less ill defined dystrophies or purely anamnestic data. Presumed reinfections in the presence of only more or less vague dystrophies as the sole evidence of congenital syphilis cannot be accepted. The first infection must be proved to be congenital. Second infection is rare in persons with acquired syphilis who have reached the latent stage before treatment is instituted. As the first early congenitally syphilitic persons adequately treated by modern standards are now reaching an age at which the incidence of acquired syphilis is high, search among them for reinfections may yield valuable information. In the files of the Syphilis Clinic of the Johns Hopkins Hospital there are 104 cases of probable or possible reinfection. Only 3 of these represent reinfections in possible congenitally syphilitic patients. One of these first came under observation at the age of 8 years and is not included because the syphilis

may have been acquired early in life. The other 2 cases are reported in detail. The congenital syphilis was adequately treated. They conform to rigid criteria for both the congenital and the acquired infection. There were thirteen years of clinical and serologic negativity, including a negative cerebrospinal fluid, between the first patient's congenital and acquired infection. Although the serologic test for syphilis of the second patient at no time became entirely negative, there were at least eight years of clinical negativity, including a negative cerebrospinal fluid, between the congenital and the acquired infection.

### Anesthesiology, New York

2:121-244 (March) 1941

- Present Status of the Problem of Preventing Anesthetic Explosions. J. W. Horton, Cambridge, Mass.—p. 121.
- Prevention of Cyclopropane-Oxygen Explosions by Dilution with Helium. G. W. Jones and G. J. Thomas, Pittsburgh.—p. 138.
- The Hazard of Fire and Explosion in Anesthesia: Report of Clinical Investigation of 230 Cases. B. A. Greene, Brooklyn.—p. 144.
- \*Anesthesia in Relation to Cardiac Disease. L. C. Reid, New York.—p. 161.
- Intravenous Use of Dihydromorphinone Hydrochloride (Dilaudid) for Analgesia. C. J. Betlach, Chicago.—p. 170.
- Criteria in Choice of Anesthesia. M. Saklad, Providence, R. I.—p. 172.
- Experiment in Recording of Surgical and Anesthetic Data in Military Service: Adaptation of Hollerith Punch Cards, Used at Second Army Maneuvers, 1940. C. P. Wangeman, Madison, Wis.—p. 179.
- Influence of Cyclopropane on Peripheral Blood Flow in Man. D. I. Abramson, A. I. Grollman and A. L. Schwartz, Cincinnati.—p. 186.
- Stability of Vinyl Ether (Vinethene). J. Adriani, New York.—p. 191.
- Regional Anesthesia for Surgery of Thorax and Abdominal Wall. T. H. Seldon, Rochester, Minn.—p. 194.
- Nupercaine and Dextrose 1:1,500 Solution for Spinal Anesthesia: Preliminary Report of 450 Cases. B. B. Sankey and R. J. Whitacre, East Cleveland, Ohio.—p. 203.
- Subarachnoid Block with Crystalline Pontocaine. W. L. Garth, San Diego, Calif.—p. 205.

**Anesthesia in Relation to Heart Disease.**—Reid, in discussing the relation of anesthesia to heart disease, confines his remarks to anesthesia and the cellular respiration mechanism, the role of vitamin B, vagovagal reflexes and the climacteric. Cellular respiration is defined as those biologic processes and chemical mechanisms by which the cell converts the bound radiant energy of the sun stored in foodstuff molecules to free, utilizable, biotic energy, thereby making possible cellular activity and existence. Any cardiac lesion which involves either the vascular tree, the myocardium or the specific tissue will lead to a profound disturbance in the production of energy. In such an instance this energy production is still further interfered with by anesthetic agents which inhibit dehydrogenases. This action is probably the principal cause of the hyperglycemia which so often accompanies anesthesia. Many of the failures of carbon dioxide build-up, previously explained on the basis of deficient oxygen intake, are more readily intelligible on the basis of an inhibition of the dehydrogenases. It seems logical to the author to compensate for a decreased efficiency of the cellular oxidation-reduction systems, as a result of the action of anesthetic agents, by an increased oxygen tension through a supplemental oxygen supply. In any event, after the necessity for anesthesia has passed, the earlier the cells are returned to their optimal functional capacity the better. Vitamin B plays a singularly important role in cellular activity, and an adequate amount of this substance is necessary in the diet in heart disease, particularly if anesthesia is contemplated. The respiratory carriers coenzyme I, coenzyme II and flavoprotein are synthesized from the constituents of vitamin B<sub>2</sub>. The active functioning part of coenzyme I and coenzyme II is nicotinic acid amide and riboflavin of flavoprotein. Vagovagal reflexes frequently disturb cardiac activity. Vagovagal reflexes might very well give rise to constriction of the coronary arteries with decreased blood supply to the myocardium. These reflexes are important at any time, but particularly so in structurally altered hearts or during light anesthesia. All hearts under anesthesia are functionally deranged; that is, a normal heart under anesthesia is as vulnerable to derangement from vagal stimulation as an organically diseased heart would be without anesthesia. The potentially injurious effects on cardiac activity of vagovagal reflexes are preventable or at least can be minimized by atropine therapy. The climacteric gives rise to innumerable complaints. Hot flushes and palpitation are almost regular occurrences. A high percentage of women have palpitation, cardiac pain and dyspnea; a triad often found in organic heart lesions. These symptoms, Scherf has shown, were reversible

with estrogen therapy. Electrocardiograms of such patients have revealed sinus tachycardias, depressions of the ST segment and flattening of the T waves, all of which disappear under estrogen therapy. Therefore all patients during the climacteric who have symptoms suggesting myocardial disease, particularly if they have fibroids and are about to be operated on, should have the benefit of estrogen therapy to exclude the possibility of a deficiency as being the etiologic factor.

### Annals of Internal Medicine, Lancaster, Pa.

14:1315-1498 (Feb.) 1941

- \*Neurologic Symptoms and Clinical Findings in Patients with Cervical Degenerative Arthritis. S. R. Mettier and C. S. Capp, San Francisco.—p. 1315.
- Studies in Cellular Exudates of Bowel Discharges: III. Diagnostic Significance of Cellular Exudate Studies in Chronic Bowel Disorders. Z. Bercovitz, New York.—p. 1323.
- Role of Coronary Artery Disease in Etiology of Auricular Fibrillation. I. C. Brill and W. A. Meissner, Portland, Ore.—p. 1341.
- Balance Between Capsular Polysaccharide and Antibody in Relation to Prognosis and Therapy of Pneumococcal Pneumonia. J. G. M. Bullowa, S. C. Bukantz and P. F. de Gara, New York.—p. 1348.
- Observations on Absorption, Excretion and Distribution of Sulfanilamide, Sulfapyridine, Sulfathiazole and Sulfamethylthiazole. E. Strauss, F. C. Lowell, F. H. L. Taylor and M. Finland, Boston.—p. 1360.
- Problem of Rheumatism and Arthritis: Review of American and English Literature for 1939 (Seventh Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz.; J. A. Key, St. Louis, and C. McEwen, New York.—p. 1383.

**Neurologic Symptoms in Cervical Arthritis.**—Mettier and Capp analyzed the symptoms suggestive of cervical nerve-root origin in 30 patients presumably having osteoarthritis. Attempt was made to correlate the symptoms with the changes seen in the cervical vertebrae in roentgenograms taken in anteroposterior, lateral and oblique projections. The patients examined had symptoms characteristic of cervical radiculitis. Most of them were between 40 and 60 years of age. Only 3 were less than 40 years of age. The symptoms complained of were pain, rigidity of the neck and muscular weakness of the hand or arm. The onset of pain was usually abrupt and was localized in and about the shoulder, especially about the insertion of the deltoid muscle, or radiated down the arm into the fingers. As a rule these symptoms appeared months or even years before there were any complaints of neck discomfort. Usually the pain was unilateral. Some patients complained only of numbness and tingling in the fingers or of a drawing or dead, aching sensation in the muscles of the arms. Restriction of use of one upper extremity was a common complaint. There was no atrophy of the muscles of the hands, arms or shoulder girdle. The arm reflexes were normal. The presence or absence of arthritis in the cervical vertebrae was determined by roentgen observations. Marked hypertrophic changes were observed in 18 patients. These consisted of circumferential osteophyte formation which projected into the intervertebral canals from the superior or inferior vertebral margins, causing slight to marked narrowing of the foramina, depending on the size of the hypertrophic spurs. The osteoarthroses were more frequently on the left side. In the areas of exostoses the intervertebral disks were thinned out, causing slight narrowing to almost complete obliteration of the intervertebral spaces. The sites of predilection were between the fifth and sixth and the sixth and seventh vertebrae. The symptoms of 7 other patients were similar, but the roentgen signs of osteoarthroses were minimal in degree. There was a minimal to slight degree of osteophyte formation on the adjacent surfaces of the vertebrae, usually the fifth and sixth. This was accompanied by narrowing of the intervertebral disks in only 3 patients. In most of the patients there was some sclerosis of the articular facets. In the remaining patients there was no apparent abnormality of the articular facets, evidence of proliferative new bone formation at the vertebral margins, noticeable narrowing of the intervertebral foramina or thinning of the intervertebral disks in the roentgenograms. From the roentgen study it is evident that the combination of narrowing of the intervertebral foramina by the ingrowth of the marginal osteophytes and the decrease in the vertical diameter of the foramina, as seen in the 18 patients, may impinge on the nerve trunk as it passes through the involved foramina or may affect the sympathetic fibers con-



trolling blood flow. Why this process picks out the sensory fibers and does not also involve the motor fibers may be the fact that the motor fibers are fewer in number and comprise a bundle only one third the size of the posterior sensory fibers. Therefore actual diminution in the size of the nerve trunk may be sufficient to give rise to the radicular syndrome. It is unlikely that a similar process can adequately explain the neurologic symptoms arising in the other patients, as there was no radiopaque material in the intervertebral foramina suggesting impingement on a nerve bundle. The syndrome is of relatively frequent occurrence and, as a rule, is inadequately treated. The 30 patients were encountered in less than three months. Many had resorted to forms of treatment not regularly recognized by the medical profession. Those whose treatment was basically manipulative had definite relief. In the authors' clinic treatment consisted of heat to the neck, massage, manual traction and manipulation. Most of the patients were relieved of pain.

### Archives of Internal Medicine, Chicago

67:473-708 (March) 1941

- \*Effect of Liver Therapy on Pathways of Spinal Cord in Subacute Combined Degeneration. C. Davison, New York.—p. 473.  
Chronic Nonleukemic Myelosis: Report of Case with Megakaryocytic Myeloid Splenomegaly, Leukoerythroblastic Anemia, Generalized Osteosclerosis and Myelofibrosis. G. Carpenter and C. M. Flory, Chicago.—p. 489.  
Smallness or Absence of Initial Positive Deflections in Precordial Electrocardiogram and Cardiac Infarction: Study of Patients Who Came to Autopsy. F. B. Cutts, A. H. Clagett Jr. and F. T. Fulton, Providence, R. I.—p. 509.  
\*Epidemic Poliomyelitis, Recurrent Encephalomeningoradiculitis and Fibromyositis in Relation to Streptococci Obtained from Water Supply. E. C. Rosenow, Rochester, Minn.—p. 531.  
Postural Hypotension: Disease of Sympathetic Nervous System. E. A. Stead Jr. and R. V. Ebert, Boston.—p. 546.  
\*Aluminum Phosphate in Therapy of Peptic Ulcer: Effect of Aluminum Hydroxide on Phosphate Absorption. G. B. Fauley, S. Freeman, A. C. Ivy, A. J. Atkinson and H. S. Wigodsky, Chicago.—p. 563.  
Acute Sclerosing Vascular Disease with Renal Changes: Report of Case. R. Katzenstein and J. P. Murphy, New Haven, Conn.—p. 579.  
Estimation of Ascorbic Acid (Vitamin C) Requirement of Ambulatory Patients. Grace A. Goldsmith, A. T. Ogaard and D. F. Gowe, New Orleans.—p. 590.  
Vitamin C (Ascorbic Acid) Nutrition in Bronchial Asthma: Estimation of Daily Requirement of Ascorbic Acid. Grace A. Goldsmith, A. T. Ogaard and D. F. Gowe, New Orleans.—p. 597.  
Jejunal (Anastomotic) Ulcer: Clinical and Pathologic Study with Report of Eight Cases Encountered in 13,000 Necropsies. M. M. Montgomery and J. D. Kirsbaum, Chicago.—p. 609.  
Pathogenesis and Pathologic Changes in Peptic Ulcer, and Production of Pain. J. Rabinovitch, B. Pines and I. Teicher, Brooklyn.—p. 620.  
Electrocardiogram in Later Life. M. Eliazer Jr. and B. O. Kondo, San Francisco.—p. 637.  
Differentiation of Acute Coronary Insufficiency with Myocardial Infarction from Coronary Occlusion. A. M. Master, R. Gubner, S. Dack and H. L. Jaffe, New York.—p. 647.  
Hyperparathyroidism with Adenoma Causing Renal Failure and Secondary Hyperparathyroidism: Report of Case. R. S. Downs, Farmington, Conn., and V. Scott, Durham, N. C.—p. 658.  
Diastatic Activity of Human Blood. M. Somogyi, St. Louis.—p. 665.  
Bright's Disease: Review of Recent Literature. W. S. McCann, Rochester, N. Y.—p. 680.

### Liver Therapy in Subacute Cord Degeneration.—

Davison reports a postmortem study of 10 patients with pernicious anemia and neurologic signs and symptoms referable to the spinal cord. All 10 patients received liver therapy. Special study was made of the myelin sheaths, the axis cylinders and the glia. These were compared with the material studied in 1931 from untreated or inadequately treated patients. The series included 3 men and 7 women, between 35 and 76 years of age. Duration of illness varied from nine months to eight years, average four years and four months. All but 1 patient had at one time or another a blood picture typical of pernicious anemia. The 1 patient had a normal blood picture even before liver therapy was instituted. Diagnosis of pernicious anemia was made on the presence of neurologic signs referable to the posterior columns and achlorhydria. All 10 patients had achlorhydria and signs and symptoms of spinal cord involvement. The subjective neurologic symptoms improved in all but 1 patient, in whom improvement could not be evaluated because he was observed for only twenty-four hours. Objective improvement in the neurologic signs was observed in only 3 patients; in 2 the Babinski sign disappeared after liver therapy, and in 1 of these and the remaining patient the mental symptoms cleared up shortly after liver therapy was instituted. In 5 patients the histopathologic process involved the postero-

lateral columns of the cord. There was moderate gliosis in the involved pathways. The gliosis was most pronounced in the posterior columns, a condition which was best noted in the longitudinal sections. In 2 other patients the pathologic process was limited to the posterior columns and slightly to the right pyramidal tract. In the 3 remaining patients the gliosis was considerable and was present only in the posterior columns. These patients showed moderate destruction of the myelin sheaths and only slight destruction of the axis cylinders. Liver therapy was most effective in these 3 instances and led to the limitation of the process to the posterior columns, appreciable gliosis, moderate destruction of the myelin sheaths and only slight swelling of axis cylinders. In only this type of condition can improvement in the objective neurologic signs be expected. Improvement results only when there is slight destruction of the axis cylinders. Adequate liver therapy prevents further disintegration. The gliosis could not in any way restore normal function. Disease of the myelin sheaths may affect the axis cylinders and cause them to swell through irritation. Adequate liver therapy will also remove the disintegrating products and thus prevent further irritation. The sooner adequate treatment is instituted after neurologic signs and symptoms appear, the greater the chances for the signs and symptoms to disappear. Early adequate liver therapy may not only arrest or offset the progress of subacute combined degeneration of the cord but may also prevent the condition from becoming a complication of pernicious anemia, as shown by Strauss and his associates in a series of 80 cases.

Water Supply and Epidemic Poliomyelitis.—Rosenow reports the results of methods used for the isolation of pathogenic streptococci from a water supply during an epidemic of poliomyelitis in 1934 and recurring attacks of encephalomeningoradiculitis and fibromyositis in a group of patients in 1937. Streptococci were isolated more often from samples of water representing the central supply of the epidemic area than from water of control supplies, and much more often from samples obtained from the very periphery where poliomyelitis occurred and where patients who had encephalomeningoradiculitis and fibromyositis were cared for. The streptococci isolated from the water supplies resembled closely the streptococci isolated directly from patients served by the respective supplies. Each group of strains had well marked specific virulence and localizing power for animals. The serums of patients agglutinated specifically the respective strains of streptococci. The epidemic as a whole, judged by the usual epidemiologic criteria, almost certainly was not caused by contamination of the central water supply. The unprecedented high incidence of poliomyelitis among physicians and nurses attending the patients and in certain families and other groups and the high incidence of recurrent encephalomeningoradiculitis and fibromyositis during and after the epidemic would seem to incriminate the drinking water. It is considered that, in acute poliomyelitis occurring during the epidemic, the streptococcus was an integral part of the infectious process now generally attributed to virus and the cause of the unusual manifestations and that in the encephalomeningoradiculitis with fibromyositis it was the etiologic agent unassociated with the virus. The resulting diseases, however, were certainly not mainly caused by the streptococci contained in the central water supply but may have been due to peripheral "autogenous" contamination by excreta of the persons themselves. It also must be considered that the water may have been contaminated from the air. The author has isolated streptococci with specific properties from the air of rooms occupied by persons with various diseases, including poliomyelitis, and from outdoor air during epidemics.

Aluminum Phosphate for Peptic Ulcer.—Fauley and his associates present data which demonstrate that aluminum hydroxide gel interferes with phosphate absorption. They studied the effect of aluminum hydroxide gel on the excretion of phosphorus in the urine and feces of normal dogs, in 4 normal adult men receiving a "light ulcer diet," and in a child with marble bone disease on a low phosphorus diet. The results showed that aluminum hydroxide interferes with the absorption of phosphates and under certain conditions can cause a negative phosphorus balance. A phosphorus deficiency is not to be expected until the soluble aluminum salts are in excess of one

half of the total phosphorus in the diet. When this obtains in rats, chicks, guinea pigs and rabbits, the inorganic phosphorus in the blood may be reduced. Conditions predisposing to a negative phosphorus balance on aluminum hydroxide gel therapy are not likely to be present for a prolonged period in ulcer patients. The ordinary ulcer diets contain adequate phosphorus. But the possibility must be considered. Anorexia, though not pathognomonic of phosphorus deficiency, is a conspicuous symptom. Alkalies, gastric mucin, various diets and aluminum hydroxide and phosphate gel have been given Mann-Williamson dogs. The most favorable results were obtained with aluminum phosphate gel. Gastric mucin was definitely better than alkalies and aluminum hydroxide gel but was inferior to aluminum phosphate gel. The administration of large doses of mineral salts which react with the acidic or alkaline juices, whether such salts are absorbed or not, interferes with the natural mineral metabolism of the body. This disadvantage appears to be reduced by relatively inert substances, such as aluminum phosphate, which buffers acid and has a mildly astringent effect. Aluminum phosphate gel administered with a special diet prevented the development of ulcer in all but 3 of 23 Mann-Williamson dogs. After aluminum phosphate gel was discontinued and an ulcer developed, its administration caused complete healing of the ulcer in 9 of 10 dogs. These results were so favorable that aluminum phosphate gel was administered to 32 patients with duodenal and 2 with gastric ulcer to ascertain whether it might be of value. An ulcer diet was prescribed during the active stage of the ulcer combined with 15 cc., or occasionally 30 cc., of aluminum phosphate gel every two hours. Later a dose of 50 cc. with meals and at bedtime, or 30 cc. six times a day with and between meals, was prescribed. The diagnosis in all cases was supported by roentgen examinations. Seven of eight ulcer craters filled in, the exception being in 1 patient with a diagnosis of "subacute perforation" of a duodenal ulcer. This patient was not relieved by any therapy and was subjected to operation. Of 3 other failures 1 occurred in a patient with duodenal ulcer who had had many recurrences. He responded to rest, mucin and aluminum phosphate gel. Another patient with duodenal ulcer had a hemorrhage after fourteen days of treatment with aluminum phosphate and an ambulatory regimen. He responded promptly to management with rest, restricted diet, mucin and aluminum phosphate. The fourth failure was in a patient with duodenal ulcer who complained of intermittent atypical distress during several months of therapy. The same distress occurred with any type of management, and as the roentgen signs improved during management hypochondria was suspected. The response of all the other patients to the therapy was good. These results, the authors warn, should not be interpreted as indicating that aluminum phosphate therapy is superior to other therapies. The results indicate only that aluminum phosphate gel has the promise of being as effective as any other similarly acting medicament. The experimental results do not necessarily imply that aluminum phosphate gel is superior to aluminum hydroxide gel except in the presence of a relative or an absolute deficiency of pancreatic juice and bile.

### Delaware State Medical Journal, Wilmington

13:17-34 (Feb.) 1941

Present Status of Vaccination Against Disease. J. A. Kolmer, Philadelphia.—p. 17.

\*Immediate Allergic Reactions to Schick Test. J. R. Beck, Dover.—p. 26.

**Immediate Allergic Reactions to Schick Test.**—Beck reports three immediate allergic reactions which occurred in children who had been previously given a Schick test and who also had had alum precipitated toxoid before the first Schick test. The Schick tests which caused these reactions gave negative readings in all 3 children. It seems that hypersensitive persons may become sensitized to one of the proteins in the Schick material or in the alum toxoid, and on subsequent Schick testing an allergic reaction may occur. Its incidence is relatively infrequent, as the three reactions occurred among 15,726 Schick tests, and at least 4,000 individuals of the group had had two or more tests. Epinephrine should be on hand in the event that it might be needed, particularly when a person is being

retested or has had alum precipitated toxoid. A tourniquet tied tightly enough to prevent rapid dissemination of the injected material may be of greater importance than the injection of epinephrine hydrochloride, but this the author did not do in his 3 cases.

### Indiana State Medical Assn. Journal, Indianapolis

34:111-174 (March) 1941

- Cerebral Hemorrhage. P. L. Stier, Fort Wayne.—p. 111.  
Helping the Injured with Physical Therapy. N. H. Palmer, New Orleans.—p. 114.  
The Council on Physical Therapy: Brief Review of Its Scope and Accomplishments. H. A. Carter, Chicago.—p. 115.  
Surgical Applications of Physical Medicine. E. N. Kime, Indianapolis.—p. 117.  
Medical Aspects of Physical Therapy. E. L. Libbert, Lawrenceburg.—p. 121.  
Report on 1940 Hospital Survey on Physical Therapy. N. H. Prentiss, Fort Wayne.—p. 125.  
Delirium Associated with Cataract Extraction. D. A. Boyd Jr. and Mary A. Norris, Indianapolis.—p. 130.  
Uses of Progesterin in Obstetrics and Gynecology. F. W. Peyton, Lafayette.—p. 136.  
Office Management of Pelvic Diseases. W. H. Howard, Hammond.—p. 138.  
Newer Proved Therapeutic Agents. M. Casper and G. J. Petro, Louisville, Ky.—p. 141.  
Anesthesia for Oral Surgery During Infancy. J. D. Spaid, Dayton, Ohio.—p. 143.

### Journal of Clin. Endocrinology, Springfield, Ill.

1:91-194 (Feb.) 1941. Partial Index

- Hypothyroidism in Childhood: Parts III and IV. L. Wilkins and W. Fleischmann, Baltimore.—p. 91.  
Pituitary and Adrenocortical Insufficiency: Use of Sodium Chloride in Treatment of Hypopituitarism. D. J. Stephens, Rochester, N. Y.—p. 109.  
Oral Therapy of Testicular Deficiency: Methyl Testosterone Administered Orally to Patients with Marked Testicular Deficiency. W. M. Kearns, Milwaukee.—p. 126.  
Adiposogenital Dystrophy: Study of Untreated "Fröhlich's Syndrome" Without Brain Tumor. S. C. Werner, New York.—p. 134.  
Androgen Therapy in Psychosis: Effect of Testosterone Propionate in Male Involutional Psychotics. D. H. Pardoll and L. Belinson, Elgin, Ill.—p. 138.  
Mammary Dysplasia: Corpus Luteum Studies: III. Progesterone Therapy in Chronic Cystic Mastitis. C. F. Geschickter, Baltimore.—p. 147.  
Androgen Therapy in the Human Female. S. H. Geist, New York.—p. 154.  
Rationale for Androgen Therapy in Gynecology. U. J. Salmon, New York.—p. 162.  
Rationale of Androgenic Therapy in Gynecology. E. C. Hamblen, Durham, N. C.—p. 180.

### Journal of Clinical Investigation, New York

20:107-248 (March) 1941. Partial Index

- Renal Blood Flow in Coarctation of Aorta. M. Friedman, A. Selzer and H. Rosenblum, with technical assistance of Patricia McLean and W. Picard, San Francisco.—p. 107.  
Measurements of Blood Flow and Blood Pressure in Clubbed Fingers. M. Mendlowitz, New York.—p. 113.  
Toxicity of Orally Administered Potassium Salts in Renal Insufficiency. A. W. Winkler, H. E. Hoff and P. K. Smith, New Haven, Conn.—p. 119.  
\*Effects of Patent Ductus Arteriosus on Circulation. E. C. Eppinger, C. S. Burwell and R. E. Gross, Boston.—p. 127.  
Cardiac Output and Other Measurements of Circulation in Coarctation of Aorta. H. J. Stewart and R. L. Bailey Jr., New York.—p. 145.  
Lysocleithin and Hemolytic Anemia: Significance of Lysocleithin Production in Differentiation of Circulating and Stagnant Blood. K. Singer, Boston.—p. 153.  
Pathogenesis of Azotemia in Hemorrhage from Upper Gastrointestinal Tract. J. B. Johnson, Rochester, N. Y.—p. 161.  
Renal Tubular Excretion of Creatinine in Normal Man. J. A. Shannon and H. A. Ranges, New York.—p. 169.  
Observations on Inhibition of Sulfonamide Action by Para-Aminobenzoic Acid. E. Strauss, F. C. Lowell and M. Finland, Boston.—p. 189.  
Hydrogen Ion Concentration of Duodenal Contents Under Fasting Conditions in Normal Persons and in Patients with Duodenal Ulcer: Comparative Study. R. W. Kearney, M. W. Comfort and A. E. Osterberg, Rochester, Minn.—p. 221.  
Study of Urinary Riboflavin Excretion in Man. A. E. Axelrod; T. D. Spies, Cincinnati, and C. A. Elvehjem, with technical assistance of Velma Axelrod.—p. 229.  
Studies on Infectious Mononucleosis: II. Relationship of Organisms of Genus *Listeria* to the Disease, as Studied by Agglutination Reaction. C. A. Janeway and G. J. Dammin, Boston.—p. 233.

**Patent Ductus Arteriosus and Circulation.**—Eppinger and his co-workers report the results of quantitative studies of the circulation in 6 patients with patent ductus arteriosus, and in animals in which a condition similar to a patent ductus arteriosus was produced at operation. In each of the patients

patency of the ductus arteriosus was confirmed at operation. The patent ductus arteriosus was the only demonstrable anomaly. The patients were selected for operation on the basis of impressive signs or symptoms and their ducts (which measured from 7 to 9 mm. in diameter) were presumably larger than many that are recognized. When the ductus arteriosus is patent the blood flow is from the aorta to the pulmonary artery. There is no flow of blood from the pulmonary artery to the aorta. Therefore these patients do not have arterial unsaturation and are not cyanotic. The volume of blood flowing from the aorta to the pulmonary artery varied from 4 to 19 liters per minute, which is from 45 to 75 per cent of all the blood pumped into the aorta by the left ventricle. These flows occurred in patients with large ducts and under temporary conditions known to elevate cardiac output. The left ventricle expelled from two to four times the volume of blood expelled by the right ventricle. Adjustment of the circulation to the patent ductus may be made by an increase in the output of the left ventricle. If this does not compensate completely for the leak through the ductus the blood flow to the periphery may also be diminished. Comparable studies in dogs supply direct evidence of the beneficial effects of operative closure which improves the peripheral circulation and reduces the work of the heart.

# **Journal Industrial Hygiene & Toxicology, Baltimore** 23:93-128 (March) 1941

- Studies of Workers Exposed During Production of Lead Bearing Steel (Ledloy). A. G. Kammer, East Chicago, Ind.—p. 93.
- Atmospheric Concentration of Lead Fume Associated with Forging, Welding and Oxygen Cutting of Lead Bearing Steel, Based on Experimental Studies. J. W. Halley, East Chicago, Ind.—p. 100.
- Effect of Short Rest Pauses in Standing and Sitting Position on Efficiency of Muscular Work. E. Simonson and N. Enzer, Milwaukee.—p. 106.
- Carbon Tetrachloride as Industrial Hazard: Report of Two Cases. E. M. Hammes Jr., Boston.—p. 112.
- Severe Pneumoconiosis Caused by Inhalation of Fullers' Earth. W. D. McNally and I. S. Trostler, Chicago.—p. 118.

# **Journal-Lancet, Minneapolis** 61:69-104 (March) 1941

- Beta Irradiation in Ophthalmology. W. K. Stenstrom, E. P. Burch and F. M. Walsh, Minneapolis.—p. 69.
- Arm Suspension After Breast Operation. A. N. Collins, Duluth, Minn.—p. 72.
- The Health of College Students and National Defense. Ruth E. Boynton, Minneapolis.—p. 74.
- Carpal Bone Fractures: Report of Case. P. T. Sorenson, Minot, N. D.—p. 76.
- Indications for Operative Interference in Obstetrics. R. J. Moe, Duluth, Minn.—p. 79.
- Problem of Essential Hypertension. C. N. Hense, St. Paul.—p. 83.
- Congenital Absence of Common Duct: Three Cases in One Family. N. K. Hopkins, Arlington, S. D.—p. 90.
- Hearing Impairment in College Students. H. Newhart, Minneapolis.—p. 92.
- Diethylstilbestrol: Review of Literature. C. H. McKenzie, Minneapolis.—p. 94.

# **Journal of Nervous and Mental Disease, New York** 93:281-420 (March) 1941

- Sign of Babinski. K. Goldstein, Boston.—p. 281.
- Exhaustion Due to Mental Excitement. C. J. Milling, Columbia, S. C.—p. 297.
- Lilliputian Hallucinations During Convalescence of Scarlet Fever. N. Savitsky and S. Tarachow, New York.—p. 310.
- \*Lead Encephalopathy in Children and Adults: Clinicopathologic Study. A. J. Akelaitis, Rochester, N. Y.—p. 313.
- Alcoholic Neuropathy with Multiple Sclerosis. S. Androp, Catonsville, Md.—p. 333.
- Bergeron's Chorea. H. G. Hadley, Washington, D. C.—p. 344.

**Lead Encephalopathy in Children and Adults.**—Akelaitis made a clinicopathologic study of lead encephalopathy in 3 children, 2 of whom died, and 2 adults, 1 of whom died. The postmortem study suggests that the structural changes in children and adults are a result of edema with exudation and hyperplastic changes in the leptomeninges and endothelial cells of the blood vessels. However, in children the process is apparently more severe and the meningeal hyperplasia may lead to hydrocephalus. The lesions may vary with the duration of the intoxication before death occurs. The clinical picture in children is analogous to that of conditions in which the intra-

cranial pressure is increased. The prognosis is grave and residuums are frequent if the child survives. The clinical picture in adults is analogous to that of any severe cerebral intoxication.

# **Journal of Nutrition, Philadelphia** 21:209-320 (March) 1941. Partial Index

- Cereals and Rickets: XIII. Phytic Acid, Yeast Nucleic Acid, Soybean Phosphatides and Inorganic Salts as Sources of Phosphorus for Bone Calcification. C. H. Krieger, R. Bunkfeldt, C. R. Thompson and H. Steenbock, Madison, Wis.—p. 213.
- Life Time Experiments on Problem of Optimal Calcium Intake. F. O. Van Dwyne, C. S. Lanford, E. W. Toepfer and H. C. Sherman, New York.—p. 221.
- Effect of Various Amounts of Caffeine on Gaseous Exchange and Respiratory Quotient in Man. J. Haldi, G. Bachmann, C. Ensor and W. Wynn, Emory University, Ga.—p. 307.

# **Journal of Pediatrics, St. Louis** 18:289-428 (March) 1941

- Clinical Appraisal of Growth in Children. J. D. Boyd, Iowa City.—p. 289.
- Levels of Ascorbic Acid in Blood Plasma of Apparently Healthy Children. F. E. Holmes, G. E. Cullen and W. E. Nelson, Cincinnati.—p. 300.
- \*Vitamin E in Treatment of Muscle Disorders of Infancy and Childhood. S. Stone, Manchester, N. H.—p. 310.
- Vitamin K and Prenatal and Postnatal Prevention of Hemorrhagic Disease in Newborn Infants. F. S. Bruchsalter, Dallas, Texas.—p. 317.
- Vitamin P and Capillary Fragility. H. G. Rapoport, with assistance of Sylvia Klein, New York.—p. 321.
- Capillary Resistance in Rheumatic Children. E. E. Brown and Valentina P. Wasson, New York.—p. 328.
- Formol Gel Test During Rheumatic Fever of Childhood: Comparison with Sedimentation Rate and Weltmann Reaction. R. I. Klein, S. A. Levinson and C. K. Stulik, Chicago.—p. 337.
- Fibrinolysin Test in Rheumatic Fever. P. L. Boisvert, New Haven, Conn.—p. 357.
- Electrocardiogram in Rheumatic Fever: Study of Sydenham's Chorea. E. T. Heffer, Brooklyn.—p. 363.
- Hippuric Acid Liver Function Test in Children. S. Loude and J. G. Probst, St. Louis.—p. 371.
- Neural Maturation of Infant as Exemplified in Righting Reflex or Rolling from Dorsal to Prone Position. Myrtle B. McGraw, New York.—p. 385.
- II. Effect of Cooking on Digestibility of Cereals. J. R. Ross, Doris Monypenny and S. H. Jackson, Toronto.—p. 395.
- \*Banana Diet in Treatment of Typhoid Fever in Children: Preliminary Report. W. F. Schoffman, Phoenix, Ariz.—p. 399.

**Vitamin E for Muscle Disorders of Children.**—Stone treated 2 children with pseudohypertrophic muscular dystrophy and 2 with congenital myotonia with vitamin E. After from three to six months of treatment there has been a striking formation of new muscle tissue, generalized increase in strength and sense of well being. This has become apparent only since the children were placed on vitamin E. Only 1 of the patients has made a complete recovery. Through the facilities of the crippled children's and orthopedic clinics the effect of vitamin E has been observed on a large group of children between 1 and 5 years of age who came to the clinic because of poor muscular development, inability to hold up their heads until they were 2 or 3 years old, and retardation in beginning to stand or walk alone. The possibility that the muscle disturbances were caused by vitamin E deficiency in a lesser degree than present in muscular dystrophies and myotonias prompted the addition of vitamin B complex and vitamin E to these children's diets. While the vitamin B complex tended to improve their appetite or produced increase in weight, the response in muscle strength was rather slow. When vitamin E in the form of wheat germ oil was added to the vitamin B complex the increase in muscle strength was more rapid. Usually within a month the mother reported that the child was able to stand better, hold up its head, turn over without assistance and attempt walking alone. An increase in mental alertness was observed in some of the children. Children with flaccid musculature responded much better than the spastic group. The dosage in the dystrophic and myatonic group was from 2 to 4 cc. of fresh wheat germ oil given daily together with the vitamin B complex. In infants and young children with generalized muscular hypotonia the initial dose was from 8 to 12 minims (0.5 to 0.7 cc.) of wheat germ oil, preferably with vitamin B complex. Deficiency in the mother during pregnancy, or her inability to transmit vitamin E to the offspring, is possibly a factor in the development of an impaired musculature of the newborn infant. Probably certain types of muscular dystrophy, some myotonias (Oppenheim) and certain cases of poor muscular development

in the young infant are due to the same deficiency. This hypothesis is supported by the fact that vitamin E was of definite therapeutic value in such cases. As most children's diets are likely to be deficient in vitamin E, it is suggested that in certain obscure nervous and muscular disturbances of childhood vitamin E deficiency should be investigated as one of the causes.

**Banana Diet for Typhoid in Children.**—Schoffman observed 3 children who were fed abundant amounts of banana while ill with typhoid. Two of the patients were treated at home, and the laboratory data are not complete. All 3 patients, however, were so severely ill that their improved general state following the institution of the fruit and fruit-milk diet was not expected so soon in typhoid patients. The temperature curve decreased strikingly in from two to five days, even though the stools did not show such prompt improvement. The period of acute symptoms was shortened. The stools were negative for typhoid in from three to four weeks after onset of symptoms. The author believes that the banana and milk diet warrants further investigation.

### Kentucky Medical Journal, Bowling Green

39:87-118 (March) 1941

- Why Our Profession Sought a Premarital Law. A. T. McCormack, Louisville.—p. 94.  
The Operation of the Premarital Law in the Physician's Office. F. W. Caudill, Louisville.—p. 94.  
The Laboratory in Relation to the Premarital Law. L. H. South, Louisville.—p. 96.  
Clinical Aspects of the Premarital Law. W. U. Rutledge, Louisville.—p. 98.  
Syphilis, Its Modern Management. R. E. Teague, Louisville.—p. 100.  
Use of Gold in Treatment of Arthritis. A. C. McCarty, Louisville.—p. 107.  
Psychiatry and Military Service. J. D. Campbell, Louisville.—p. 110.

### Maine Medical Association Journal, Portland

32:51-78 (March) 1941

- Diabetes: Some Considerations from the Point of View of the Internist. S. Gundersen, Hanover, N. H.—p. 51.  
Cardiovascular Problem with Renal Involvement and Hypertension. J. Gottlieb and C. W. Steele, Lewiston.—p. 56.  
Blood Dyscrasia Presenting Clinical and Pathologic Problems: Case. J. Gottlieb, Lewiston.—p. 63.

### Michigan State Medical Society Journal, Muskegon

40:161-240 (March) 1941

- Self-Inflicted Injuries in Civil Practice. D. Hart, Durham, N. C.—p. 179.  
Septic Branchial Cyst, Eradication by Electrical Cauterization: Report of Case. C. A. Berge, Detroit.—p. 189.  
Cancer of Cervix: Time Wasted. O. E. Todd, Toledo, Ohio.—p. 191.  
Moniliasis: Sulfapyridine Treatment. R. S. Van Bree, Grand Rapids.—p. 197.  
Sulfamethylthiazole in Staphylococcus Albus Bacteremia Secondary to Carbuncle of Nose. D. L. Finch, Augusta, in collaboration with S. Alpiner and A. A. Humphrey, Battle Creek.—p. 199.  
Experience with the Blood Bank. O. A. Brines and J. E. Manning, Detroit.—p. 201.  
Development of the Plasma Bank. O. A. Brines and J. E. Manning, Detroit.—p. 204.  
Rheumatic Fever: Preventive Aspects. H. H. Riecker, Ann Arbor.—p. 208.

### Missouri State Medical Assn. Journal, St. Louis

38:71-106 (March) 1941

- Study of Epidemic Influenza, with Special Reference to 1940-1941 Outbreak in St. Louis. S. E. Sulkin, J. F. Bredeck and J. C. Willett, St. Louis.—p. 71.  
Dwarfism. A. A. Werner, St. Louis.—p. 75.  
Cervical Carcinoma Associated with Pregnancy at Full Term. W. T. Stacy and F. G. Thompson Jr., St. Joseph.—p. 82.  
Repair of Arteriovenous Fistula and Resultant Aneurysmal Varix Between Femoral Artery and Vein. B. L. Neubeiser and B. H. Bradley, St. Charles.—p. 84.  
Medionecrosis Aortae Idiopathica Cystica with Spontaneous Rupture: Report of Three Cases with Necropsies. J. W. Fleming, Moberly, and F. C. Helwig, Kansas City.—p. 86.  
Histaminase: Clinical Experiences in Nonallergic Diseases. R. O. Muether, G. A. Mitchell, K. R. Andrews and G. Jones, St. Louis.—p. 89.

### Nebraska State Medical Journal, Lincoln

26:77-118 (March) 1941

- Toxemias of Pregnancy. C. P. Huber, Indianapolis.—p. 77.  
Hemorrhage in Pregnancy. M. E. Davis, Chicago.—p. 84.  
Treatment of Puerperal Sepsis. W. E. Brown, Omaha.—p. 91.

### New England Journal of Medicine, Boston

224:401-440 (March 6) 1941

- Management of Complications of Peptic Ulcer. T. G. Miller, Philadelphia.—p. 401.  
Pelvic Delivery Under Local Infiltration Anesthesia. C. P. Sheldon, Boston.—p. 404.  
Carcinoma of Esophagus Developing in Benign Stricture. E. B. Benedict, Boston.—p. 408.  
Intravenous Drip Administration of Autonomic Drugs. A. Myerson and J. Loman, Boston.—p. 412.  
Carcinoma of Cervix: Review of 200 Cases Treated with Radium. G. C. Wilkins, Manchester, N. H.—p. 414.  
Encephalopathy Associated with Sulfamethylthiazole Therapy. E. Roseman and C. D. Aring, Cincinnati.—p. 416.  
The Vitamins. A. P. Meiklejohn, Boston.—p. 420.

### New York State Journal of Medicine, New York

41:531-642 (March 15) 1941

- Virus Diseases in Childhood. F. H. Wright, Chicago.—p. 559.  
The Male Factor in Fertile, and Barren Marriage. R. S. Hotchkiss, New York.—p. 564.  
Regional Enteritis: Report of Two Cases. I. E. Siris, New York.—p. 571.  
Hemorrhage in Otolaryngology: Methods of Control. M. F. Jones, New York.—p. 580.  
Tellurite Test for Diagnosis of Diphtheria. M. S. Stern, San Fernando, Calif., and M. B. Brahdy, Mount Vernon.—p. 588.  
Prescription for Skin. H. Goodman, New York.—p. 590.  
Program for Detecting Possible Toxic Responses to Varied Organic Chemical Exposure. J. H. Sterner, Rochester.—p. 594.  
Office Treatment of Industrial Accidents. H. L. Prince, Rochester.—p. 600.  
Convalescent Care at the Saratoga Spa. E. J. Callahan, Saratoga Springs.—p. 604.  
Management of Clinical Problems Involving Larynx in Infancy and Childhood. C. A. Healy, Rochester.—p. 607.

### Northwest Medicine, Seattle

40:75-108 (March) 1941

- Typhoid Typing an Aid to the Health Officer. W. Levin, Portland, Ore.—p. 77.  
Status of Partial Gastrectomy in Duodenal Ulcer. V. C. Hunt, Los Angeles.—p. 81.  
\*Hereditary Hemorrhagic Telangiectasia. H. Alban, Kimberly, Idaho.—p. 86.  
Isolated Myocarditis: Report of Case. I. R. Fox and R. M. Overstreet, Eugene, Ore.—p. 89.  
Twenty-One Day Fever Curve. C. H. Sprague, Boise, Idaho.—p. 91.  
Palliative Treatment of Acute Undiagnosed Skin Diseases. S. E. Light, Tacoma, Wash.—p. 92.  
Factors to Be Considered in Management of Eczema. C. Dietrich, Tacoma, Wash.—p. 94.  
Diphtheritic Membrane. S. S. Bozarth and L. J. Wolf, Portland, Ore.—p. 96.

**Hereditary Hemorrhagic Telangiectasia.**—During the last several years Alban encountered several members of a family exhibiting all the characteristics of hereditary hemorrhagic telangiectasia. Investigation indicates that this particular group is larger numerically than any family with this affliction heretofore reported in the American literature. At the rate that procreation is proceeding in this family, every one practicing in the Northwest will have a better than average chance of being called on for diagnosis and treatment of this disease. For that reason the author gives a general review of the established facts of the disease. In the family there have been no recorded deaths from hemorrhage, but its members say that they know it is not good for them to be operated on. The family tree chart indicates that there may be reason for this fear, as 4 members of the third generation have died post-operatively and 1 following childbirth. No explanation for these deaths has been elicited, and therefore the significance of an increased surgical hazard in this family is problematic. Investigation of six generations of this family revealed that 19 members were definitely affected and more will probably become affected as they reach the age at which telangiectasia usually develops. There is the usual preponderance of affected women and the usual transmission by either sex. Treatment consists principally of an attempt to arrest the bleeding and to maintain blood elements as close to normal levels as possible. The use of drugs and scrums, long advocated, is without any rationale, since it has been definitely established that the condition is due to a hereditary maldevelopment of the vascular apparatus. When the general condition becomes poor and anemia is well defined, blood transfusion is used but is only of temporary value. Angiomas may be removed by chemical and electrical cauterization and by radium. The latter appears more promising and may prove to be the treatment of choice.

## Public Health Reports, Washington, D. C.

56:311-364 (Feb. 21) 1941

- Qualifications of Professional Public Health Personnel: IV. Sanitation Personnel. M. Derryberry and G. Caswell.—p. 311.  
Studies on Active and Passive Immunity in Q Fever Infected and Immunized Guinea Pigs. Ida A. Bengtson.—p. 327.  
Effect of Sodium Selenite on Blood Sugar and Liver Glycogen of Rats and Rabbits. C. I. Wright.—p. 345.

56:365-420 (Feb. 28) 1941

- \*Domestic Water and Dental Caries: I. Dental Caries Study, Including Lactobacillus Acidophilus Estimations, of a Population Severely Affected by Mottled Enamel and Which for the Past Twelve Years Has Used a Fluoride-Free Water. H. T. Dean, P. Jay, F. A. Arnold Jr. and E. Elvove.—p. 365.  
Further Study of Rorschach Test Applied to Delinquents. M. J. Pescor.—p. 381.  
Ornithodoros Viguerasi, New Species of Tick from Bats in Cuba (Acarina: Ixodoidea). R. A. Cooley and G. M. Kohls.—p. 396.

**Domestic Water, Mottled Enamel and Dental Caries.**  
—According to Dean and his associates, epidemiologic evidence points to an inverse relationship between endemic dental fluorosis (mottled enamel) and dental caries. Many of the epidemiologic, biochemical, bacteriologic and experimental aspects of this phenomenon have been discussed, but its mechanism is not clear. Whether this inhibitory agent operates locally or systemically or involves structural or compositional factors is undetermined. For the purpose of possibly clarifying several of the undetermined questions, quantitative epidemiologic studies were made of (1) populations exposed to waters of a relatively high fluoride concentration during the period of tooth calcification followed during the post eruptive period by waters free of fluorides and (2) populations whose teeth calcified while using waters free of fluorides but followed during the post eruptive tooth period by exposure to waters whose fluoride content exceeded the minimal threshold of endemic dental fluorosis 1 part per million. The study was made at Bauxite, Ark., a community which has occupied a prominent place in the history of mottled enamel since 1928, when the source of the water was changed. Although the number of school children available for study at Bauxite was limited, it consisted of all Bauxite pupils present on the day of sampling who had developed mottled enamel while using the "old" Bauxite water supply. They were mostly pupils in the high school and the higher elementary grades and ranged from 14 to 22 years of age. This group consisted of 26 who gave a history of continuous exposure to the Bauxite common water supply and 24 who had mottled enamel while using the "old" Bauxite water but whose water histories included minor breaks in continuity of exposure. All in this group showed a relatively moderate to severe type of mottled enamel. Another group consisted of 49 children from 8 to 13 years of age with a history of continuous use of the Bauxite common water supply, including 26 children from 8 to 10 years of age born more than one and one half years after the change in the water supply and 23 children from 11 to 13 years of age born within one and one half years of the water change. A roughly comparable group in age was had in 45 Benton (Ark.) high school pupils who had never used water containing an excess of fluoride. No mottled enamel was observed in any of these pupils. The dental caries experience rate for the permanent teeth of the 50 Bauxite pupils with mottled enamel was 314 per hundred children; the 45 Benton pupils with no mottled enamel showed a rate of 675. A previous study in 1939 by Dean and his collaborators has shown that the use of a domestic water with a fluoride concentration (1.8 parts per million) not greatly in excess of the minimal threshold for endemic dental fluorosis was associated with unusually low oral lactobacillus counts. Whether the observed effects were the result of local, systemic, structural or compositional factors in the teeth is not known. The incidence of dental caries in deciduous molars does not show the cumulative increase concomitant with increasing years of exposure. It actually reverses this trend; the highest incidence is observed in the youngest age group. With approximately nine years of exposure to the risk of dental caries, only six deciduous molars were carious, or 9 per cent of the sixty-six deciduous molars present in the 17 children born prior to the change in

the water supply. In 21 children born within a year or two after the change and whose deciduous molars had approximately six and one half years of risk exposure thirty-one were carious or about 22 per cent of the one hundred and forty-one deciduous molars present. In 19 children born three and four years after the change fifty-two of these teeth showed carious involvement, or about 36 per cent of the 143 deciduous molars present.

## Radiology, Syracuse, N. Y.

36:261-390 (March) 1941

- Abnormalities of Small Intestine in Nutritional Disturbances: Some Observations on Their Physiologic Basis. R. Golden, New York.—p. 262.  
Roentgen Diagnosis of Duodenal Ulcer. A. R. Bloom, Detroit.—p. 287.  
Duodenal Diverticula. S. Weintraub and A. Tuggle, New York.—p. 297.  
Anatomicoroentgenographic Study of Pleural Domes and Pulmonary Apexes, with Special Reference to Apical Subpleural Scars. H. W. Jamison, Los Angeles.—p. 302.  
\*Management of Cancer of Breast with Preoperative and Postoperative Irradiation. S. G. Schenck, Brooklyn.—p. 315.  
Kidney Stones Stimulating Biliary Concretions: Roentgenographic Study. G. Danelius, Chicago.—p. 324.  
Evaluation of Cancer Statistics by Correlation Analysis. L. G. Jacobs, Winona, Minn.—p. 334.  
Monomelic Medullary Osteosclerosis of Unknown Etiology. T. Horwitz, Philadelphia.—p. 343.  
X-Ray Treatment of Leukemias. S. Rubinfeld and L. D. Scott, New York.—p. 352.  
Calcified Mucocoele of Appendix, with Rupture. H. W. Ostrum and R. F. Miller, Philadelphia.—p. 356.  
Osteochondrodystrophy (Morquio): Case Reports and Follow-Up. R. J. Reeves and G. J. Baylin, Durham, N. C.—p. 362.

**Preoperative and Postoperative Irradiation for Mammary Cancer.**—As therapy depends on the stage in which the disease is first seen, Schenck considers the clinical types or "stages" of breast cancer. In stage 1 the tumor is usually small (less than 3 cm. in diameter), freely movable and confined strictly to the affected breast. No regional nodes are felt. In stage 2 firm nodes are palpable in the axilla, the primary tumor is usually larger than 3 cm. and partially fixed to the skin and the underlying tissues (pectoral muscle or fascia). The case belongs in stage 3 when the breast is edematous or its skin is inflamed, when the tumor is large, when it is more or less fixed to the skin and underlying structures, when adherent nodes are palpable in the axilla and in the supraclavicular fossa or when distant metastasis is present. Stage 4 is represented by recurrent cancer. When the diagnosis of breast cancer is warranted and the stage of the disease is determined, the patient should receive a thorough course of high voltage roentgen treatments. This series of treatments is all important and no compromise is tolerable. In stages 1 and 2 radical surgery is indicated from six to eight weeks after irradiation. This is to be followed from four to six weeks after operation by a second adequate course of roentgen treatments. Holfelder reports twice as many five year cures in patients receiving postoperative therapy as compared with those treated by operation alone. Roentgen sterilization of the ovaries, the author believes, tends to improve the end results and is at least advisable for all patients who are still menstruating. Patients with stage 3 cancers are mainly a roentgenologic problem. They should receive as thorough a course of roentgen treatments as their condition permits. The individual as well as the disease must be treated. This is followed by conservative surgery or radium therapy as the case indicates. Further roentgen therapy is given as it becomes necessary for relieving pain and discomfort. Recurrent cancer requires radium or roentgen therapy or both. Radiation therapy should be applied and managed only by expertly trained specialists. The entire affected breast is cross fired through two ports. The rays are directed tangentially through the anterior wall of the chest so that the underlying lung is avoided. Two hundred roentgens is given daily to each of the two ports for a total of from 2,000 to 2,600 roentgens to each area. The factors used are 200 kilovolts, 50 cm. distance and filters of 2 mm. of copper and 1 mm. of aluminum. At the completion of the treatments to the breast the axilla is cross fired through anterior and posterior ports. Two hundred roentgens is given daily to each of the two fields for a total of from 1,200 to 1,800 roentgens to each. Finally, the supraclavicular fossa is treated, through anterior and posterior ports,



each area receiving 200 roentgens daily for a total of from 1,600 to 2,000 roentgens. Little radiation sickness has followed this technic. The postoperative course of radiation therapy is similar to the preoperative treatments, except that dosage is kept within the lower limits. The anterior wall of the chest is treated by tangential, obliquely directed rays. The cutaneous reaction must be closely watched during therapy. The entire scar is included in the irradiation. If for any reason preoperative irradiation was omitted, postoperative therapy is given about two weeks after surgery or as early as is commensurate with the patient's condition. Roentgen therapy promotes rather than retards healing of the wound. The postoperative therapy is indicated to prevent local recurrence and regional metastasis. As a rule, only one postoperative course of treatments is given. Further therapy, either by the roentgen rays or by radium, is indicated only in the presence of recurrence or metastasis. Irradiation for local and regional recurrences should be cautiously and judiciously applied, bearing in mind that the skin has already been exposed to two episodes of epidermolysis. Nevertheless such treatments are not contraindicated.

## Surgery, Gynecology and Obstetrics, Chicago

72:551-678 (March) 1941

- Cranio cerebral Injury. A. P. Rowlette and D. O. Weiner, St. Louis.—p. 551.
- Pathogenesis and Treatment of Unilateral Exophthalmos. L. Davis and J. Martin, Chicago.—p. 557.
- \*Treatment of Diffuse Peritonitis by Direct Intraperitoneal Introduction of Sulfanilamide. S. Rosenberg and N. M. Wall, Pittsburgh.—p. 568.
- Treatment of Acute Appendicitis in a Municipal Hospital. J. Burke and H. F. Kuhn, Buffalo.—p. 578.
- Etiology and Pathology of Dupuytren's Contracture. H. W. Meyerding, J. R. Black and A. C. Broders, Rochester, Minn.—p. 592.
- Teratoma Testis: Survey of Thirty-Seven Autopsy Records. B. S. Barringer and D. Earl, New York.—p. 591.
- Arthrograms of Hip Joints of Children. E. Severin, Stockholm, Sweden.—p. 601.
- \*Implantation of Solid Pellets of Estrogens in Treatment of Menopausal Symptoms. G. H. Twombly and R. S. Millen, New York.—p. 605.
- Carcinoma of Lower Intestinal Tract. R. E. Bieren, Baltimore.—p. 611.
- Choice and Use of Cotton for Suture Material. S. A. Localio and J. W. Hinton, New York.—p. 615.
- \*Prevention of Human Bite Infections. R. E. Speirs, Dodge City, Kan.—p. 619.
- Treatment of Rupture of Urethra, Especially When Accompanying Fractures of Pelvic Bones. J. H. Harrison, Boston.—p. 622.
- Transumbilical Repair of Congenital Umbilical Hernia. J. B. Blodgett, Boston.—p. 632.
- \*Carcinoma Erysipelatodes: Subepidermal Lymphatic Metastases Confused with Operative Sequelae. M. R. Camiel and H. Bolker, Brooklyn.—p. 635.
- Transurethral Prostatectomy: Photographic Record of Operation of Transurethral Resection. F. H. Colby and H. I. Suby, Boston.—p. 642.
- Free Bone Flap Osteoplastic Craniotomy. E. Boldrey, San Francisco, and W. Cone, Montreal, Canada.—p. 646.
- Management of Appendical Stump: Inversion Without Ligation of Stump. L. Felger, Los Angeles.—p. 650.
- Superficial Infections Due to Anaerobic Streptococci: Indications for Zinc Peroxide Treatment. J. Reicher, Dayton, Ohio.—p. 651.
- Varus Deformity of Ankle Following Injury to Distal Epiphyseal Cartilage of Tibia in Growing Children. G. G. Gill and L. C. Abbott, San Francisco.—p. 659.
- Fractures of Both Bones of Forearm in Children. B. M. Bosworth, New York.—p. 667.

**Local Sulfanilamide for Diffuse Peritonitis.**—Rosenberg and Wall describe the results in rats following intraperitoneal implantation of sulfanilamide powder for the treatment of diffuse peritonitis. Their clinical experience is limited to 10 cases: 7 of diffuse peritonitis secondary to perforated appendix and 3 miscellaneous cases of peritoneal contamination. Recovery occurred in all instances. In the animal experiments and clinical cases the general effectiveness of sulfanilamide was shown. However, the authors state that none of this proves anything with the exception that sulfanilamide introduced intraperitoneally is in no way locally destructive or harmful to delicate tissue such as the intestinal serosa. Intraperitoneal sulfanilamide appears to have some advantage over the parenteral method. The action is more than that of absorption and systemic action and probably is due to sulfanilamide action because of an increased focal concentration. In the human being the one instillation of intraperitoneal sulfanilamide should not be depended on. It should be immediately augmented by subcutaneous sulfanilamide. The introduction of powdered sulfanilamide into the peritoneal cavity at operation after the removal

of the offending focus is not offered as a substitute for time honored and well established methods but merely as a positive additional weapon in the constant struggle against the disease.

**Implantation of Estrogen Pellets for Menopausal Symptoms.**—Twombly and Millen have implanted solid pellets of estrogenic materials in the treatment of 37 patients suffering from menopausal symptoms, 4 with kraurosis and leukoplakia of the vulva, 4 with leukoplakia buccalis or chronic stomatitis and 1, hyperfunction of the adrenal cortex. In general, those suffering from menopausal symptoms have been greatly relieved for from five months to more than a year. The patients with kraurosis have been improved but not cured. No effect has been noted on leukoplakia buccalis or chronic stomatitis. The only noticeable effect on the hirsute woman was the suppression of her scanty menstrual periods for two months. Pellets of 20 mg. of estradiol have proved most efficacious for prolonged alleviation of menopausal symptoms. The effective total dose has varied from one to three pellets implanted intramuscularly at intervals of one month. Their full effect becomes apparent in about one month. The effect lasts from five months to one year, as determined by improvement of subjective symptoms and vaginal smears. Pellet implantation is contraindicated in women with intact uteri as they have caused profuse and prolonged bleeding in 9 of 12 such patients. No bleeding has occurred in patients who have received castrating doses of radium some time before estrogenic therapy. Carcinomas of the breast or cervix have not been observed. Two carcinomas of the cervix and one dysgerminoma of the ovary have shown no accelerated growth after treatment.

**Prevention of Human Bite Infections.**—Speirs discusses the data in 114 cases of human bite infection seen within a few hours after the trauma. The method (gentle but thorough cleansing with soap and water, débridement only of damaged tissue and the application of a dry sterile dressing without suture) of Mason and Koch was followed in 82 cases and some variation of the procedure in the remaining 32 cases. There were no infected wounds among the 82 patients, except of 2 whose wounds over the knuckle were sutured. In 7 of the 14 patients who were treated with phenol and alcohol more evidence of inflammation developed than was usual; wounds became red, swollen and indurated but did not suppurate. Two patients with knuckle injuries which were cleansed and sutured required hospitalization later. The results in the entire group of cases have been gratifying, especially in comparison to former experience with cauterization, excision or extensive cleansing with strong chemical agents. The results confirm the author's belief that cleansing of the wound with soap and water within a few hours after the injury is the method of choice for prophylaxis of human bite infections. By this means the healing time of the wound is shortened and tissue destruction is minimized. In 35 patients the average time for complete healing was seven and eight-tenths days. In 60 other patients healing had progressed sufficiently far in an average time of four and nine-tenths days to warrant discharge. It is a good rule to consider any small penetrating wound on the hand as a human bite until proved otherwise. Bites on the fingers are generally on the distal phalanx. They vary from simple abrasions to compound fractures. Injuries to the lip range from penetrating wounds to almost complete avulsion, the latter being more common. Bites of the nose are usually extensive; they go through the ala severing the cartilage, the severed portion being attached only loosely over the bridge of the nose. After careful cleansing, loose approximation is permissible.

**Carcinoma Erysipelatodes.**—Camiel and Bolker present 2 typical cases of carcinoma erysipelatodes which developed following mastectomy. Both were mistaken for postoperative inflammatory complications, dermatitis venenata, fungous infection and radiodermatitis. The medicolegal importance of this is significant. The appearance of any peculiar cutaneous lesion following mastectomy for cancer should be regarded with suspicion and biopsy examination made. The pathologic material from repeated biopsies studied by serial sectioning indicated that the metastatic process was one of permeation of the subepidermal lymphatics and tissue spaces, rather than venous channels.

## War Medicine, Chicago

1:143-300 (March) 1941

- Nutrition Planning for the National Defense. R. M. Wilder, Rochester, Minn.—p. 143.
- \*The Soldier and His Heart. P. D. White, Boston.—p. 158.
- Medical Aspects of Submarine Rescue and Salvage Efforts. A. R. Behnke, Washington, D. C.—p. 168.
- Influence of Aircraft Performance on Selection and Care of Military Aviators. J. R. Poppen, Washington, D. C.—p. 180.
- The Medical Reserve Officer of the United States Navy Afloat. E. R. Eaton, New York.—p. 188.
- Nursing in a Program for National Defense. Pearl McIver, Washington, D. C.—p. 196.
- Neuropsychiatric Aspects in the First World War and in the Present Emergency. I. J. Sands, Brooklyn.—p. 203.
- The Army Medical Officer Looks at Psychiatry. S. A. Cohen, New York.—p. 205.
- Psychiatric Examination in the Armed Forces. K. M. Bowman, New York.—p. 213.
- Neuroses of War. A. Kardiner, New York.—p. 219.
- Tetanus Toxoid for Prophylaxis. E. P. Jordan and G. Halperin, Chicago.—p. 227.
- Diagnosis and Treatment of Venereal Diseases: Circular Letter No. 18. Prepared by the Subcommittee on Venereal Diseases of the Committee on Chemotherapeutic and Other Agents.—p. 247.

**The Soldier and His Heart.**—White reviews briefly the history of soldier's heart or neurocirculatory asthenia in the army. Various sources show that the chief problems concerning the soldier's circulation in the latter half of the last century were syphilitic aortitis and valvular heart disease (organic disease) and neurocirculatory asthenia (functional disorder). By 1914 to 1918 great advance had been made in weeding out important organic lesions at the time of enlistment. However some cases escaped detection and others developed in service, but "soldier's heart" became an outstanding problem. These conditions together ranked third in the causes for discharge from the British Army and Navy up to the last day of May 1918. The author states that his experience with the American Expeditionary Force in France in 1917 and 1918 was similar except that he, in comparison, found fewer organic lesions. After the World War there were (and there still are) a moderate number of so-called cardiac cripples. Most of these had neurocirculatory asthenia, which often was erroneously labeled "myocarditis" before neurocirculatory asthenia was recognized as a just cause for disability. A tabulation of 100 ex-soldiers sent to the United States Public Health Service Hospital showed 36 with a diagnosis of valvular heart disease or myocarditis. Further investigation revealed neurocirculatory asthenia alone in 45, aortic and mitral valvular disease in 16, mitral involvement alone (chiefly stenosis) in 7, aortic regurgitation alone in 6, other heart disease (1 of congenital and 1 of coronary disease) in 4 and 22 miscellaneous conditions other than heart disease. A considerable advance has been made in the last two decades in (1) rejection of new recruits with significant cardiovascular lesions, (2) early recognition of disabling cardiac conditions in the army itself and (3) measures to protect the soldier from some of the causes of heart disease, particularly syphilis and rheumatism. The 1938 report of the Surgeon General of the United States Army gave a death rate for 1937 of 3.48 per thousand among 175,624 officers and men, and only one tenth (0.35 per thousand) of the deaths were ascribed to diseases of the circulatory system as compared to the incidence cited by Myers for the British Army seventy-five years earlier, when the total death rate was more than twice as high and deaths from disease of the circulatory system three times as numerous. Now there is less heart disease in the army than in the civilian population, whereas from seventy-five to one hundred years ago soldiers actually showed a greater incidence. Of the grand total of 14.98 men per thousand discharged for disability from the United States Army in 1937, 0.92 per thousand had circulatory disabilities. Neurocirculatory asthenia no longer appears under diseases of the circulatory system but is included under diseases of the nervous system. The classification is probably still not correct. The discharge rate for neurocirculatory asthenia in 1937 was 0.24 per thousand; this is twice as great as the rate for coronary disease and a little greater than that for arteriosclerosis in other locations. In dealing with the problems concerning the soldier and his heart physicians must first try to hold the great gains that have been made in the last generation; this is difficult

when large numbers of new recruits must be examined and enlisted. However some preparedness can be effected by careful universal periodic examination of the male population of military age in time of peace. This doubtless will some day be a routine public and private health measure. The important specific problems are: (1) to learn the range of the normal heart as to size, sounds, action, roentgen picture and electrocardiogram, (2) to decide what minor abnormalities may be safely passed for military service, (3) to detect beginning lesions of the heart and aorta, (4) to decide what newly acquired lesions or symptoms are compatible with military life and in what capacity and (5) to study coronary disease and severe neurocirculatory asthenia, in order to prevent or to minimize them or at least to recognize them early. A persistently high pulse rate is a more important indication of possible neurocirculatory asthenia of significance than an elevated blood pressure. The cardiovascular criteria for admission to the Army was revised last summer.

## Wisconsin Medical Journal, Madison

40:169-268 (March) 1941

- \*Glucose-Insulin Treatment of Advanced Portal Cirrhosis. J. A. Schindler, Monroe.—p. 187.
- Foreign Body in Appendix. A. R. Curreri and D. W. Melick, Madison.—p. 192.
- Staphylococcemia and Agranulocytosis: Report of Three Cases, with Special Reference to Drug Toxicity. B. I. Pippin, Richland Center.—p. 194.
- Inflammatory Cutaneous Metastatic Carcinoma. M. J. Reuter, Milwaukee, and R. Nomland, Iowa City.—p. 196.
- Diagnosis of Early Neurosyphilis. W. Marshall, Appleton.—p. 201.
- The General Practitioner's Role in Prevention of Eclampsia. J. M. Freeman, Wausau.—p. 204.

**Dextrose-Insulin for Advanced Portal Cirrhosis.**—Schindler points out that he has found dextrose-insulin treatment to "turn the trick" in cases of advanced portal cirrhosis refractory to medical measures. He states that three years ago while he was giving from 400 to 600 Gm. of carbohydrate daily to a patient with Laënnec's cirrhosis considerable amounts of dextrose were present in the urine. Thinking to obviate this gross waste of carbohydrate, he gave insulin in amounts sufficient to render the urine practically sugar free. If dextrose was given intravenously it was preceded by half an hour with an amount of insulin adequate to keep sugar from appearing in the succeeding urine. The ascites disappeared two weeks after insulin was begun and this in a patient who had twenty-eight paracenteses in thirty weeks. The patient remained otherwise on the original treatment. After two months insulin was withdrawn and in a fortnight paracentesis again became necessary. The insulin was resumed and again withdrawn on three subsequent occasions so that the relation of the insulin to the disappearance of the ascites seemed established. The same procedure was repeated in 2 additional patients with far advanced Laënnec's cirrhosis with similar results. After they had received insulin for nine, six and six months, respectively, the liver recovered sufficiently to function without the insulin. All the patients have returned to a fair degree of activity and their hepatic functions, as measured by the hippuric acid synthesis and other tests, are normal. The effect of the insulin when first used was neither foreseen nor expected. Most of available data indicate that, rather than causing a deposition of glycogen in the liver, insulin actually produces a glycogen withdrawal. However, recent work by Crandall tends to show that, when a hyperglycemia exists, insulin facilitates the deposition of glycogen in the liver; this establishes a rational basis for the use of insulin in these cases. With the disappearance of ascites, blood protein rises, and although it raises the osmotic pressure it cannot be a factor in the removal of the ascites because the increase is not appreciable until after the ascites has disappeared. This same treatment (high carbohydrate intake, yeast, thiamine hydrochloride and sufficient insulin to prevent glycosuria) has been tried in other forms of hepatic damage. It has not been successful in 2 cases of cirrhosis accompanying long standing cardiac decompensation and in 1 case of syphilitic cirrhosis. Although it appears to be strikingly successful in catarrhal jaundice, the nature of the disease renders therapeutic evaluation difficult and not trustworthy.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## Brain, London

63:295-384 (Dec.) 1940

- Vasomotor Reflexes in Control of Body Temperature in Man. J. J. R. Dutbie and R. M. I. Mackay.—p. 295.  
Spinal Complications of Paget's Disease (Osteitis Deformans). J. W. A. Turner.—p. 321.  
Supratentorial Adamantinoma and Eunuchism. Gwenvron M. Griffiths.—p. 350.  
Primary Degeneration of Granular Layer of Cerebellum: Unusual Form of Familial Cerebellar Atrophy Occurring in Early Life. R. M. Norman.—p. 365.

## British Journal of Ophthalmology, London

25:97-140 (March) 1941

- Changes in Fundus Oculi Following Splanchnectomy in Malignant Hypertension. F. T. Tooke and J. V. V. Nicholls.—p. 97.  
The Tabetic Pupil. P. W. Leathart.—p. 111.  
Experimental Radiography of Small Fragments of Glass in Relation to the Human Eye. R. U. Gillan.—p. 117.  
Simple Optical Appliance for Use with Respirators. P. Kinmont.—p. 122.

## Journal of Endocrinology, London

2:141-262 (Dec.) 1940. Partial Index

- Thyroid and Brain Respiration. R. J. Rossiter.—p. 165.  
Reply to Recent Criticisms of the Theory of a Relationship Between Vitamin E and Estrogens. E. V. Sbate.—p. 173.  
Dose/Response Relation for Certain Principles of Pituitary Gland, and of Serum and Urine of Pregnancy. C. W. Emmens.—p. 194.  
Calcium and Phosphorus Metabolism in Thyrotoxicosis. G. E. Beaumont, E. C. Dodds and J. D. Robertson.—p. 237.

## Medical Journal of Australia, Sydney

1:193-222 (Feb. 15) 1941

- Military Surgery. W. G. D. Upjohn.—p. 193.  
Gas Tensions in Tissues in Pathologic Conditions. E. W. Sibree.—p. 201.

1:223-256 (Feb. 22) 1941

- Method for Rapid Alkalinization of Urine. Marjorie Bick and E. B. Drevermann.—p. 223.  
Retroposition of Transverse Colon Complicated by Ileocecal Volvulus: Report of One Case with Recovery and Review of Literature. T. F. Rose.—p. 225.  
Sulfur Content of Milk. R. C. Hutchinson.—p. 229.  
Paralysis of Serratus Anterior Muscle Complicating Dislocation of Shoulder. G. C. V. Thompson.—p. 231.  
Progress Report on Orthoptics in Tasmania. J. B. Hamilton.—p. 233.  
Some Ophthalmic Problems in Aviation. L. Price.—p. 235.

1:257-284 (March 1) 1941

- \*Bone Marrow Changes in Acute Infections and Effects of Sulfonamides on Marrow. T. E. Wilson.—p. 257.  
Photofluorography: Use of Miniature Film in X-Ray Diagnosis. K. E. Shellshear and B. P. A. Stuart.—p. 265.  
Photofluorography. H. B. Gough.—p. 267.

1:285-314 (March 8) 1941

- Plan for Racial Health. S. Boyd.—p. 285.  
Estimation of Isoagglutinin Titer of Human Serum and Its Practical Applications. Lucy M. Bryce and Rachel Jakobowicz.—p. 290.  
Treatment of Fibrositis and Allied Disorders by Local Anesthesia. M. Kelly.—p. 294.  
Use of Local Anesthesia in Relief of Chronic Pain. R. N. Howard.—p. 298.

1:315-344 (March 15) 1941

- Freedom of the Medical Profession. A. E. Brown.—p. 315.  
Isoagglutinin Titer of Pooled Serum or Plasma. Rachel Jakobowicz and Lucy M. Bryce.—p. 318.  
Experimental Measles: Transmission of Disease to Monkeys, Failure to Transmit Measles to Rabbits, Cultivation of Virus on Chorio-Allantoic Membrane. E. W. Hurst and Barbara Cooke.—p. 323.

**Bone Marrow in Infections and Effect of Sulfonamides on Marrow.**—Wilson reviews the literature on the bone marrow changes following sulfonamide therapy and states that during the last four years more than 50 cases of neutropenia and agranulocytosis, 30 cases of hemolytic anemia and 1 case of leukoerythroblastic anemia have been reported. He has examined the marrow, either during treatment or immediately after death, of 20 patients treated with various amounts of sulfonamides, and in no instance was he able to find quantitative or qualitative changes in the marrow cells which were not present in the marrow of similar patients not treated with sulfonamides. In the reported cases sulfanilamide was prac-

tically the only sulfonamide associated with the development of acute hemolytic anemia, no case followed the use of sulfapyridine and in no case was its administration related to neutropenia. In the cases in which the marrow was examined it appears that associated with the neutropenia of the peripheral blood there was a partial or complete disappearance of the adult granular cells of the marrow and an increase in the more primitive granular series of cells. The author observed "toxic" granules in the cytoplasm of the neutrophil cells in the marrow smears. The degree depended on the severity of the infection. These granules were more numerous in the cells at the myelocyte stage than in the mature cells. In pernicious anemia changes were not found in the myeloblasts. Few macropolyocytes were found in the bone marrow of patients with acute infections. Although they were present in the marrow of most of these patients, they were usually not released into the peripheral blood. It is suggested that the macropolyocytes arise in infections because toxins interfere with the metabolism of the hemopoietic principle and from a direct toxic effect on the cells. There was no variation in the macropolyocytes from the marrow of patients treated with sulfonamides and that from similar patients without such treatment. Nuclear budding and partial division of the nuclei of neutrophil cells and their precursors, only when prepared from curettings emulsified in serum, were most numerous in the marrow from patients with severe infections. Polykaryocytes or large multinucleated giant cells were found in the marrow of 3 patients with severe infections. It is suggested that these cells were osteoclasts. Sulfapyridine administered to 4 patients suffering from acute leukemia did not alter the clinical condition, the blood, the bone marrow or the prognosis. The conclusion is that when sulfonamides produce little or no effect on the peripheral blood there are no changes in the marrow which can be attributed to the therapy.

## Practitioner, London

146:129-192 (March) 1941

- Some Diseases of Retina. M. Whiting.—p. 129.  
Sudden Failure of Vision. J. R. Wheeler.—p. 137.  
Industrial Injuries of Eye. H. W. Archer-Hall.—p. 144.  
The Watery Eye. P. G. Doyne.—p. 151.  
Use of Plaster of Paris for Air Raid and Other Casualties. A. S. B. Bankart.—p. 154.  
Colles Fracture in General Practice. R. S. Garden.—p. 162.  
Rheumatic Myalgias. M. G. Good.—p. 167.  
Mountain Sickness. C. W. A. Searle.—p. 175.  
Modern Therapeutics: XXI. Solanaceous Alkaloids and Relief of Spasm. R. St. A. Heathcote.—p. 178.

## Quarterly Journal of Medicine, Oxford

10:1-64 (Jan.) 1941

- Critical Review: Mechanism of Hemostasis. R. G. Macfarlane.—p. 1.  
Clinical Value of Thiochrome Test for Aneurin (Vitamin B<sub>1</sub>) in Urine. D. McAlpine and G. M. Hills.—p. 31.  
Wernicke's Encephalopathy: Clinical Features and Their Probable Relationship to Vitamin B Deficiency. A. C. P. Campbell and W. R. Russell.—p. 41.

## South African Medical Journal, Cape Town

15:41-60 (Feb. 8) 1941

- Complications of Acute Appendicitis in 575 Cases. J. F. P. Erasmus.—p. 45.  
Anesthesia in Thoracic Surgery. E. G. van Hoogstraten.—p. 49.

## Tubercle, London

22:1-32 (Jan.) 1941

- Treatment of Tuberculous Lung Cavities by Closed Suction Drainage—Monaldi's Method. H. Roche.—p. 1.

## Bull. of Health Org., League of Nations, Geneva

9:1-130 (No. 1) 1940

- Alcoholism in the Rural Environment. G. Szulc.—p. 1.  
Ninth Analytic Review of Reports from Pasteur Institutes on Results of Antirabies Treatment. A. G. McKendrick.—p. 31.  
Antirabic Immunization: Living Vaccines and Killed Vaccines. G. Proca and S. Bobes.—p. 79.

9:131-246 (No. 2) 1940

- Report on Terminology in Malaria. R. Christophers, L. W. Hackett, E. Sergeant, W. Schüffner and M. Ciuca.—p. 131.

**Practica Oto-Rhino-Laryngologica, Basel**  
3:193-320 (Nos. 3-4) 1940

Sepsis After Angina. A. Weder.—p. 193.  
Studies on the Perception of Sounds. A. Stefanini.—p. 285.  
Nontuberculous Multiple Perforations of Tympanic Membrane. M. Schmidt.—p. 292.  
\*Air Embolism in Otorrhinology. L. Fleischmann.—p. 295.

**Air Embolism in Otorrhinology.**—According to Fleischmann, gaping of a vascular tear and negative pressure in the vein lead to aspiration of air. The first of these two factors exists in otorrhinology, because the sinus wall is fixed to a rigid bone wall and spontaneous collapse is therefore impossible in case of tear. The jugular vein is likewise situated so that gaping of a tear is facilitated. The same is true of the subclavian artery. For this reason the cervical region is a dangerous zone as regards embolism. The sitting or half sitting posture, movements involved in swallowing and deep inspiration facilitate the entrance of air. Air embolism develops in otologic surgery generally during the change of dressings because factors favorable to entrance of air (sitting position, uneasiness of the patient and deep breathing) are more prevalent at that time than during the operation. Therefore manipulations on the sinus and change of bandage, especially after opening of the sinus, should always be carried out with the patient in the recumbent position. Since the healthy sinus wall may become diseased after the operation, and since it may tear while the bandage is being changed, the exposure of the healthy sinus is not without danger and should not be done unnecessarily. The author describes 3 cases in which air embolism developed but had a favorable outcome. Mild cases of air embolism may escape recognition. The most constant and important symptom is the sucking-gurgling noise produced by aspiration of air. It ceases if pressure is exerted on the vascular opening. Air vesicles or foamy blood may appear in the wound. The so-called mill-wheel sound is produced by the mixture of air and blood in the right side of the heart. Depending on its severity, it may be perceptible only by means of the stethoscope or at a distance of several meters. Other signs are dyspnea, cyanosis, coughing, palpitation, restlessness, a feeling of congestion, irregular pulse, and piercing pains in the chest. If air aspiration is slight, there may be almost no symptoms or the symptoms subside rapidly. Rapid aspiration of large quantities of air leads to collapse and may cause death within a few minutes or hours. After air aspiration has taken place, further intake of air should be prevented by placing the head low, applying tamponade to the sinus wound and compressing the jugular vein. The cardiac and pulmonary function must be maintained by cardiac stimulants, by artificial respiration and perhaps by intracardial injection of epinephrine.

**Giornale di Clinica Medica, Parma**

21:1451-1524 (Dec. 10) 1940. Partial Index

\*Psychoses from Bromide: Cases. G. Nizzi Nuti.—p. 1451.  
Granulocytopenic Acute Myelosis (Schultz's Type) with Hemorrhages: Case. S. Raffaele.—p. 1483.

**Psychoses from Bromides.**—According to Nizzi Nuti, psychoses from bromides are more frequent than generally believed. They show the acute phase of bromide intoxication. A neuropathic constitution, a diet poor in salt and a personal sensitivity to the drug are the most important predisposing factors. The diagnosis is made from the clinical history of the patient and the local and general clinical symptoms. The course and prognosis of the intoxication are, as a rule, benign. They depend on the acuteness of the intoxication and the functional condition of the kidney. The best and most simple treatment consists in immediate discontinuation of the drug and of any sedatives and the oral administration of 5 Gm. of sodium chloride daily for about one month. A diet rich in salt completes the treatment. During the first few days there is hyperbromidemia and aggravation of psychosis, which improves as the treatment progresses. When there is a great amount of bromides in the blood, repeated aspiration of the gastric juice with a stomach tube at frequent intervals is advisable. Sodium chloride and food are administered by the tube. Spinal fluid drainage may be resorted to in acute cases to prevent intracranial hyperpressure. The maintenance of

normal intestinal and renal functions is constantly controlled. The author reports 2 instances in neuropathic patients who had had a diet poor in salt and diminished chloridemia. The amount of bromides in the gastric juice was increased before treatment and diminished after it. The basal metabolism, which was increased before treatment, became normal after. The amount of chlorides in the blood slightly increased. Discontinuation of bromides and salt therapy resulted in rapid recovery of the patients.

**Medicina del Lavoro, Milan**

31:145-168 (July) 1940. Partial Index

\*Lipids in First Aid Treatment of Aniline Poisoning. C. Bellesini.—p. 156.

**Lipids in First Aid Treatment of Aniline Poisoning.**—Bellesini found that intravenous injection of lecithin or cholesterol to animals with acute aniline poisoning prevented hemolysis and the nervous symptoms of acute aniline poisoning. He reports satisfactory results with lecithin as first aid treatment in several cases of aniline industrial poisoning. The treatment consists of detersion of the skin which has been in contact with aniline, and three intravenous injections of 10 cc. each of lecithin at intervals of one hour. Detersion of the skin is done with swabs of absorbent gauze moistened in sulfuric acid; pressure is used in rubbing the skin with these swabs, which are changed frequently. In acute cases it is advisable to withdraw 250 cc. of blood immediately before injecting the lecithin, which is followed by hypodermoclysis of 250 cc. of dextrose saline solution. Both the lecithin injections and phlebotomy are repeated at intervals of one hour up to a total number of three. General warm or hot baths are harmful. Aniline is not soluble in water. The bath favors peripheral vasodilatation, by which the process of assimilation of the substance by the body is stimulated.

**Archivos Argentinos de Pediatría, Buenos Aires**

15:1-78 (Jan.) 1941. Partial Index

\*Desoxicorticosterone Acetate in Dystrophy of Infants. F. J. Menchaca and N. Albarracin.—p. 15.

**Desoxicorticosterone Acetate in Dystrophy of Infants.**—Menchaca and Albarracin administered desoxicorticosterone acetate in conjunction with proper hygienic and dietetic therapy in 7 cases of dystrophy in infants in the first six months of life. The drug was administered in daily injections of from 1 to 1.5 mg. until from fourteen to twenty-five injections had been given for each series. The treatment consisted of two series of injections with a fifteen day interval. Satisfactory results were obtained in all but 1 case in which dystrophy was complicated by a pulmonary infection. The drug seems to have an especially favorable effect on the appetite and general condition of the patient, causing gain in weight.

**Deutsche medizinische Wochenschrift, Leipzig**

66:1389-1412 (Dec. 13) 1940. Partial Index

Deficiency of Vitamin K in Children. P. Plum.—p. 1389.  
\*New Points of View on Fundamental Change in Customary Ulcer Diets. F. Dittmar.—p. 1395.  
Prognosis of Sepsis. H. Schulten.—p. 1399.  
\*Significance of Examination of Cerebrospinal Fluid for Diagnosis of Multiple Sclerosis. W. Klimke.—p. 1402.

**Diets for Gastric Ulcer.**—Dittmar points out that allergy is an important etiologic factor in inflammatory diseases of the gastrointestinal tract. Allergic gastritis and enteritis and their sequels, the gastric and duodenal ulcers, are comparatively frequent. The author estimates that about 30 per cent of all ulcers are allergic. The realization that nutritive antigens are responsible for the development of an allergic gastritis or ulcer also makes possible a causal, dietetic treatment. The pathogenic antigens contained in the food must be completely eliminated. This makes rational therapy possible and signifies a decisive turning away from the empiric procedure of recent decades; that is, away from the polypragmatism of the customary gastritis therapy inclusive of the diets intended to protect the stomach but which, from the standpoint of vitamins and calories, are deficient diets. The pathogenic antigens are determined by the usual methods. Their elimination from

the diet is important in the allergic forms of gastritis and ulcer, but the problems of allergy must be kept in mind also in the nonallergic inflammations of the gastric mucosa, because the inflammation increases the permeability of the intestinal wall and thus results in an increased resorption of inadequately decomposed, macromolecular foreign proteins. This eventually leads to the development of allergy to new substances. The author cites as an example the milk allergy which frequently develops after gastric operations and warns against too one-sided protein diets. He discusses the significance of the constant milieu, the physiologic course of the secretion of the gastric juice, and emphasizes that for reasons of physiologic ferment secretion the diet of patients with gastric disturbances must be similar to a normal diet. He directs attention to hypoglycemic conditions that may develop in the course of the mainly protein milk diets and stresses the necessity of the frequent administration of carbohydrates. The following points must be considered in the dietetic therapy of the nonallergic gastroduodenitis or ulcer: 1. The gastrointestinal tract must not be flooded with chiefly protein food. 2. A too one-sided diet should be avoided. 3. The equilibrium within the reactive milieu of the chyme must be considered so that the normal acceleration and inhibition of the ferment secretion is insured and with it the normal course of the resorption of foods and vitamins. 4. Carbohydrates must be given frequently and in generous amounts. The author outlines a diet which takes these points into account.

**Cerebrospinal Fluid in Multiple Sclerosis.**—Klimke reports 211 cases of multiple sclerosis diagnosed in his clinic. In 42 the cerebrospinal fluid obtained from the occipital as well as from the lumbar puncture was entirely normal. The author emphasizes this because he had observed in a number of cases that the occipital fluid was still normal when the lumbar fluid had disclosed pathologic conditions. The fluid should be withdrawn as near as possible to the most massive focus; that is, lumbar puncture would be preferable in most of the early cases of multiple sclerosis. The cerebrospinal fluid showed pathologic changes in 169 (80.54 per cent) of the cases. The colloidal gold chloride test produced a left-sided curve in 137 and a right-sided curve in only 29 cases. Two other cerebrospinal fluids exhibited only a mild lymphocytosis, and one showed a slight increase in albumin. Closer analysis of the fluids showing a left-sided curve disclosed thirty-two curves without increase in protein or cells, thirty-two curves with slight increase in protein (globulins), twenty-two curves with a slightly elevated cell count and fifty-one with increase in proteins and cells. The author concludes that the colloidal gold chloride reaction, more particularly the left-sided curve, is characteristic for multiple sclerosis. More than half of the curves (59 per cent) were like those seen in dementia paralytica; that is, there was discoloration in the first two tubes from blue to white. This strong discoloration was seen in nearly all cerebrospinal fluids that also had increased protein and cell contents. However, the same deep curve was observed also in many fluids that had only an increase in the cell count or only an increased protein content and even in many fluids in which both were absent. Thus the depth of the curve cannot be dependent on an increase in protein or cells. This manifestation was designated by Thurco as cytoalbuminocolloidal dissociation. The author thinks that, in the presence of deep left-sided curves without or with only slight increase in cell count and protein, the laboratory observations suggest the existence of a multiple sclerosis, provided syphilis reactions are negative. This picture is seen in no other disorder, except that in successfully treated dementia paralytica there remains a deep left-sided curve; however, if the left-sided curve is not too pronounced and there is a slight increase in proteins and cells, tabes dorsalis must be thought of, if the syphilis reactions are negative. The essential sign of dementia paralytica, that is, intense left-sided curves with moderate or severe increase in the cell count and in protein, particularly the globulins, the author observed so rarely in multiple sclerosis that it can be disregarded. The thirty-two cerebrospinal fluids with a right-sided curve disclosed atypical pictures the form of which was approximately 00012210000, associated with slight increase in cells and albumin. In 77 cases of multiple sclerosis the author was able to repeat the fluid examination several times in the course of the treat-

ment. Six of the fluids with right-sided curves changed into typical left-sided curves and five became normal, whereas the other right-sided curves remained unchanged. The fluids with left-sided curve lost the increased cell count and protein content, but the curve remained uninfluenced. The author concludes that the change from a right-sided to a left-sided curve, the disappearance of the increase in protein and cells and the persistence of the left-sided curve indicate clearly that the left-sided curve without increase in proteins and cells, that is, the cytoalbuminocolloidal dissociation, is the characteristic picture of the cerebrospinal fluid of multiple sclerosis and that conditions resembling multiple sclerosis and presenting a right-sided fluid curve probably are not true multiple sclerosis.

### Fortschritte der Therapie, Leipzig

16:377-412 (Nov.) 1940. Partial Index

- \*Oral Treatment with Estrogenic Substance in Ovarian Insufficiency. H. Gysi.—p. 377.  
Treatment of Sympathetic Dystonia from Neurologic Point of View. H. Köbcke.—p. 388.  
Bismuth Therapy of Tonsillitis. N. Maiwald.—p. 403.

**Oral Estrogens in Ovarian Insufficiency.**—Gysi treated extragenital symptoms of ovarian insufficiency, those occurring during the menopause as well as those accompanying disturbances in the genital cycle in younger women, by the oral administration of an estrogenic preparation. He concludes that from the perlingually administered alcoholic estradiol solution the hormone is absorbed by the oral mucosa and thus enters the systemic circulation without undergoing inactivation in the portal and hepatic circulation. For this reason the drops of estradiol solution should be taken undiluted and without a drink being taken immediately after. The patient should not swallow the drops. The drops of estradiol solution employed by the author contained 15 mg. of estradiol in 20 cc. He used this form of medication for 60 women, 30 of whom had previously received the same substance by injection. In the course of the injection treatment he had observed that particularly in the patients who were troubled by lassitude, insomnia, headaches and attacks of dizziness these symptoms were temporarily intensified before the favorable influence of the treatment became manifest. With the drop medication this could be avoided, because it was possible to subdivide the daily dose. This was corroborated in the majority of cases. On the whole, the oral medication with drops of estradiol solution produced the same results as were obtained by injection. In 50 of the 60 cases the drops alone rapidly counteracted the symptoms of ovarian insufficiency; in the other 10 cases injections of estradiol had to be added. The average daily oral dose was three times 10 drops, in severe cases five times 10 drops. For sensitive patients it is advisable to begin with somewhat smaller doses (5 drops three times daily). Whereas with injections the preparation becomes effective in about three days, the drop medication shows results only after five to seven days. Depending on the type and severity of the disorder and on the nature of the treatment, the medication must be continued for a longer period. Even after the symptoms have been counteracted, it is advisable to continue the medication with a smaller dose (three times daily 5 drops).

### Klinische Wochenschrift, Berlin

19:1025-1048 (Oct. 5) 1940

- Biologic Significance of Hyperplasia of Bone Marrow in Aplastic Anemia and Related Regenerative Conditions of Bone Marrow. R. Stollmeier.—p. 1029.  
\*Efficacy of Subcutaneous Implantation of Tablets of Crystallized Desoxycorticosterone Acetate on Bilaterally Adrenalectomized Dogs. F. Billmann and F. D. Grathwohl.—p. 1030.  
Some Dermatotoxic Terpene Bodies. H. Riedel.—p. 1034.  
Meningitis Due to Anthrax Bacilli. H. Gross and H. Plate.—p. 1036.  
Liver Changes in Pulmonary Tuberculosis. A. Dzsinich and Elisabeth Nagy.—p. 1037.

**Implantation of Desoxycorticosterone Acetate Tablets in Adrenalectomized Dogs.**—Billmann and Grathwohl report the results of experiments on 2 bitches with subcutaneously implanted crystallized desoxycorticosterone acetate tablets, undertaken to test the results obtained by Thorn, Engel and Eisenberg. They found that the dogs could be maintained by the implanted crystals in metabolic balance and good physical con-



dition. On explantation, the first signs of adrenal insufficiency manifested themselves in increased urination and intensified excretion of sodium and chlorine, with a reduced potassium excretion. Loss of body weight was, however, not noted usually until the fifth or sixth day, or the general symptoms of adrenal impairment, loss of appetite, increasing debility and vomiting. No modifications in the mineral levels of the serum nor a residual nitrogen increase were observed until the general symptoms had become pronounced. Failure to explant the tablets completely, as was seen in section on 1 dog, delayed the appearance of adrenal insufficiency for three weeks. The reimplantation of the tablets in the second dog was accompanied with signs of a critical insufficiency which necessitated medication with the drug in an oil solution. Gain of body weight and recovery of total metabolic balance did not occur until several days later.

### Münchener medizinische Wochenschrift, Munich

87:1345-1376 (Dec. 6) 1940. Partial Index

Injuries and Impairments of Auditory Organ by Explosion and Sound. A. Greifenstein.—p. 1345.

\*Observations on Epidemic Meningitis During 1940 Epidemics in Hungary. F. von Nádosy.—p. 1350.

Ulcer Problem. F. A. Busch.—p. 1354.

Question of Heredity of Duodenal and Ventricular Ulcer. M. Lindlau.—p. 1356.

Use of Mercury Solutions for Diagnostic Purposes. H. Lipp.—p. 1363.

Epidemic Meningitis.—According to von Nádosy, cerebrospinal meningitis assumed epidemic proportions in Hungary during 1939 and 1940. During the height of the epidemic, between February and June 1940, 57 female patients with epidemic cerebrospinal meningitis were treated at the author's hospital. The ages of these patients varied between 10 and 68 years. Fifty-two of the patients received chemotherapy, chiefly in the form of sulfapyridine either alone or in combination with serum. Among these 52 the death rate was 7.6 per cent, whereas the total death rate (among the 57) was 12.3 per cent. This mortality rate is favorable when it is considered that the hospitalized cases are usually the more serious and the mortality rate for all Hungary was 18.5 per cent. However, even a death rate of 18.5 per cent is comparatively low when it is considered that it used to fluctuate between 20 and 80 per cent. The author thinks that the reduction in the mortality is probably the result of the introduction of the chemotherapy. He doubts that "epidemic" meningitis is always caused by the meningococcus of Weichselbaum, because the number of cases of meningitis caused by other organisms was considerable during the year under consideration. It is possible that these organisms (pneumococci, streptococci, staphylococci, tubercle bacilli and influenza bacilli) are only secondary causal agents in addition to meningococci. On the other hand, it is possible that at times of epidemics as yet unknown factors produce a "predisposition" to meningitis. The author thinks that treatment with meningococcus serum was only a supporting measure, because he found that serum therapy alone had unfavorable results whereas exclusive chemotherapy produced favorable results. Sulfapyridine was given as a rule from three to four times daily in doses of 1 Gm. This medication was continued for four or five days, the total dose amounting to 15 Gm. Myodegeneration or valvular lesions indicate an unfavorable prognosis, because among the patients with these disorders there were the most fatalities. Three patients remained deaf, and in 1 case acute encephalitis caused sudden death. Of 5 patients with bloody spinal fluid 1 died from hemocephalus internus. Myocardial changes, generally demonstrable only in the electrocardiogram, were present in almost half of the cases, but they were mild and transitory.

### Wiener klinische Wochenschrift, Vienna

53:955-976 (Nov. 22) 1940

Asthma and Suitability for Military Service. A. Zimmer.—p. 955.

\*Permanent Results of Thoracoplastic Interventions in Pulmonary Tuberculosis. H. Garber and H. Kunz.—p. 957.

Noteworthy Case of Increase in Thrombocytes. V. Lacknit.—p. 963.

Indication for Operation in Patients with Gallstones. R. Friedrich.—p. 969.

Results of Thoracoplasty.—Gärber and Kunz report the results of 450 thoracoplastic operations on 219 patients with pulmonary tuberculosis, which were performed at a Vienna hospital between 1933 and 1939. Eight of the 219 patients died immediately after the intervention; that is, the early mortality

amounted to 3.6 per cent. The authors say that thirty-two apical plastic operations were performed on 199 patients, one hundred and fourteen upper partial plastic operations, three anterior elastic plastic operations, one lower partial plastic operation and forty-nine total plastic operations. Cure (with negative sputum) was obtained in 104 patients, that is, in 52.3 per cent. Seventy-one of these 104 patients are able to work again. Thirty-three patients showed great improvement, whereas 21 patients either remained uninfluenced or became worse. Postoperative bronchogenic dissemination was the cause of two thirds of thirty-three late fatalities. Altogether, postoperative disseminations occurred in 52 patients. Apical thoracoplasty is contraindicated if active foci are demonstrable in the infraclavicular region. The authors recommend that in case of total as well as of partial thoracoplasty the first intervention should not be made on the apex but rather on the lower part, because the danger of postoperative dissemination is greater if the operation is begun from above. Total thoracoplasty should be planned in the presence of extensive processes and of large cavities.

### Kekkaku, Tokyo

18:997-1078 (Nov. 24) 1940. Partial Index

\*Virulence Studies of Avian Tubercle Bacilli. S. Asakawa.—p. 1000.

Virulence of Avian Tubercle Bacilli.—Three pathologic types of reaction, each exhibiting different degrees of virulence in rabbits, have been demonstrated in avian tubercle bacilli. These are the (1) Yersin type, which is characterized by generalized bacillemia without tubercle formation, (2) Villemin type, typified by acute miliary processes, and (3) chronic type, affecting chiefly the bones, joints and testes. Using several strains of avian tubercle bacilli, Asakawa made virulence studies in rabbits, with the following results: When virulent organisms were injected intravenously in large amounts, the animals showed the Yersin type reaction, whereas smaller doses resulted in the Villemin type reaction. In the former type of reaction the experimental animals became jaundiced in about seven days after administration and underwent sudden decrease in body weight. The greatest numbers of injected organisms were found in the liver and spleen, in which were seen globular masses of tubercle bacilli arranged in a spokelike pattern. Hyperbilirubinemia, which may be regarded as fairly specific to the effect of avian tubercle bacilli, followed the intravenous administration of organisms. Intraperitoneal injection resulted in an indefinite pathologic picture, and jaundice occurred but irregularly. After subcutaneous injection the only noticeable changes were those of local necrosis at the site of administration, no systemic manifestations being encountered. Intracutaneous injection of the suspension resulted in localized erythema and ulceration, followed by complete healing of the scar in from one to two months. The avian tuberculin test was strongly positive in animals infected with the organism. The author concludes that the type of reaction following injection of avian tubercle bacilli depends on the route and dose employed, and the Yersin type reaction is primarily a condition due to tubercle bacillemia.

### Mitt. a. d. med. Akad. zu Kioto, Kyoto

30:1057-1372 (Dec.) 1940. Partial Index

\*Pathologic Rupture of Urinary Bladder. K. Funakoshi.—p. 1057.

Pathologic Rupture of Urinary Bladder.—Funakoshi reports two cases of spontaneous or pathologic rupture of the urinary bladder, a condition which is regarded as extremely rare. The first patient, a man aged 62, gave a history of urethral stricture which had been surgically treated three years previously. The difficulty in urination, with passage of occasional blood clots in the urine and pain over the suprapubic area, continued for three years, when sudden stoppage of the urinary flow caused the patient to exert intra-abdominal pressure, which resulted in the rupture of the bladder followed by the appearance of a few drops of fresh blood from the urethral orifice. This accident was associated with abdominal pain and nausea. With the diagnosis of intra-abdominal rupture of the urinary bladder an exploratory operation was performed and the rupture verified. The sections made from a small block of tissue removed from the bladder revealed metastatic carcinoma

infiltrating the walls of the organ. The second patient, a man aged 24, gave a history of colon bacillus cystitis which occurred at the age of 12 years. Two days previous to admission he had a sudden pain in the lower part of the abdomen, which failed to improve with application of an ice bag and rest in bed. At operation a considerable amount of turbid yellowish fluid was found in the abdominal cavity; a complicating generalized peritonitis was apparent. The postoperative course was unsatisfactory, death ensuing on the thirty-fourth day. At necropsy the rupture of the urinary bladder was clearly found to be due to the effect of typical tuberculosis of the bladder. The author emphasizes the fact that in both cases the fluid found in the abdominal cavity possessed no odor characteristic of normal urine but that, when it was heated, a strong odor of typical urine developed. Chemical analysis of the fluid found in the abdomen, particularly for urobilinogen, is also of definite diagnostic aid in cases of pathologic rupture of the bladder.

### Tokyo Igakkwai Zassi, Tokyo

55:1-107 (Jan.) 1941. Partial Index

\*Studies on Alimentary Hypoglycemia. N. Kuzuya.—p. 48.

\*Influence of Operative Intervention on Blood Gases in Surgical Diseases. T. Morikawa.—p. 75.

**Alimentary Hypoglycemia.**—Kuzuya's interest in alimentary hypoglycemia was aroused by the relatively frequent occurrence of spontaneous hypoglycemia in both diabetic and non-diabetic subjects. Using 3 normal persons, 14 diabetic and 36 assorted patients, including cases of spontaneous hypoglycemia and gastroparesis, the author endeavored to study the frequency occurrence, time interval and absolute values of blood sugar in alimentary hypoglycemia and its relation to fasting hypoglycemia. The test consisted of the oral administration of 30 Gm. of dextrose to nondiabetic and 10 Gm. to diabetic patients, and the blood sugar determinations were made thereafter at thirty minute intervals for five hours. From the results obtained the author concluded that alimentary hypoglycemia occurred in practically all the subjects tested, both diabetic and nondiabetic, and the most consistent finding was a blood sugar value of 80 to 90 mg. per hundred cubic centimeters at the peak of hypoglycemia. In diabetic patients having high sugar values before administration of the test doses, the development of alimentary hypoglycemia was relatively slight. In all the subjects the difference between the average blood sugar values before and after the test doses was about 20 mg. per hundred cubic centimeters; but in the diabetic patients this value was often exceeded. There seems to be no parallel relation between the extent of alimentary hypoglycemia and the fasting blood sugar level; naturally the patients with low fasting sugar values showed a less pronounced degree of alimentary hypoglycemia than those with high fasting levels. In the nondiabetic patients alimentary hypoglycemia occurred within two to three hours after administration of the test doses, whereas in the diabetic the level began to be depressed in three to three and a half hours. In patients with gastroparesis with disturbance in carbohydrate metabolism and in subjects with spontaneous hypoglycemia the blood sugar values frequently fell below 80 mg. per hundred cubic centimeters; these patients also frequently manifested marked hyperglycemia. The most pronounced and constant alimentary hypoglycemia occurred in patients having a mild but chronic type of spontaneous hypoglycemia; in two such cases the author was able to diagnose mild diabetes.

**Blood Gases in Surgical Diseases.**—Morikawa studied the influence of operative intervention on blood gases, using Barcroft's technic, in 20 surgical cases. In chronic chest diseases with relatively severe limitation in respiratory surfaces no appreciable increase occurred in oxygen unsaturation of arterial blood, although occasionally oxygen unsaturation of venous blood may reach above 10 volumes per cent. In mild inflammatory conditions involving other areas of the body the arterial blood showed a slight increase in oxygen unsaturation, but the venous blood tends to decrease in oxygen capacity with a concomitant decrease in carbon dioxide content in patients with severe circulatory disturbance. In carcinoma of the stomach the oxygen combining power is decreased but the oxygen unsaturation of the venous blood is increased. The greatest decrease in oxygen

capacity was seen in pneumoplasty; in laparotomy the value increased but slightly. The oxygen unsaturation of the arterial blood tended to increase in pneumoplastic operation; that of the venous blood showed a tendency to decrease, the extent of fluctuations depending on the nature of the operative procedures. The carbon dioxide content of blood decreased temporarily after an operation but increased after two to three days and remained high. Blood transfusions caused temporary elevation of oxygen capacity but later depressed it. The oxygen capacity of the blood showed a slight increase during anesthesia with morphine and scopolamine, but no effect was seen with injection of camphor or in lumbar anesthesia. The carbon dioxide content of blood usually decreased under anesthesia.

### Nordisk Medicine, Stockholm

9:1-80 (Jan. 4) 1941. Partial Index

Norsk Magasin for Lægevidenskapen

\*Chylothorax. A. Høyer.—p. 40.

**Chylothorax.**—Høyer says that chylothorax, an accumulation of intestinal lymph in the pleural cavity, is an exceedingly rare condition which was first described by Bartolet in 1633. Up to 1938 only 84 cases had been reported in the literature, 48 of them of traumatic origin. The mortality rate is about 50 per cent. The case reported is the first of its kind to be published in Norway. A man aged 56 was run into by an automobile and hit in the right side. There were fractures of the ninth, tenth and eleventh ribs on the right side, in two places in the tenth rib, fracture of the right elbow and of the right fibula. Five days after the accident severe symptoms of shock appeared, and roentgen examination showed a total exudate in the right pleural cavity. In the course of ten days 6,600 cc. of exudate was aspirated from the cavity. The exudate at first resembled cocoa and gradually became cream colored. Chemical analysis of the exudate revealed values typical of chyle. After the last tapping the chyle effusion ceased. Forty days after the accident the patient was discharged as well.

### Ugeskrift for Læger, Copenhagen

103:63-100 (Jan. 16) 1941. Partial Index

\*Enlargement of Liver in Diabetes Mellitus: Examinations by Means of Liver Biopsy. N. B. Krarup and P. Iversen.—p. 63.

\*Steatosis of Liver Treated with Vitamin B<sub>1</sub>: Examinations by Means of Liver Biopsy. P. Iversen and N. B. Krarup.—p. 66.

Histopathology of Liver in So-Called Arspenamine Jaundice, Examined by Means of Aspiration Biopsy. K. Roholm and N. B. Krarup.—p. 68.

Histologic Examinations by Means of Liver Biopsy in Intermittent Juvenile Jaundice. N. B. Krarup and K. Roholm.—p. 72.

**Examinations of Liver in Diabetes.**—Krarup and Iversen report that in their two cases of grave juvenile diabetes with considerable enlargement of the liver the microscopic examinations made on liver biopsy showed the enlargement to be primarily due to an edematous choking of the individual liver cells; a slight fatty degeneration was also seen. The amount of glycogen did not exceed that found in normal livers. In one case there were considerable degenerative changes in the liver in the form of glycogen in the nuclei. In both cases the hepatic enlargement completely subsided after treatment consisting exclusively of regulation of the diabetes with diet and insulin, and simultaneously the microscopic changes disappeared, except those in the nuclei, which continued during the period of examination.

**Treatment of Steatosis of Liver with Vitamin B<sub>1</sub>.**—Iversen and Krarup examined 100 medical patients by liver biopsy. The 38 found to have steatosis of the liver included 27 of the 31 chronic alcoholic addicts in the entire material; the remaining 11 had various grave disorders. On the basis of their experience with liver biopsy on the whole the authors regard fatty infiltration of the liver as pathologic. They say that marked steatosis of the liver is frequent in chronic alcoholic addicts. Only a small percentage of these show simultaneous cirrhotic changes in the liver. Steatosis of the liver is not a stable condition but may disappear in the course of weeks or months. Whether its disappearance is due to the treatment with vitamin B<sub>1</sub> or is a result of general hospital care together with abstinence is uncertain.

## Book Notices

**What Price Alcohol? A Practical Discussion of the Causes and Treatment of Alcoholism.** By Robert S. Carroll, M.D., Medical Director, Highland Hospital, Asheville, North Carolina. With preface by Adolf Meyer, M.D., LL.D., Sc.D., Henry Phipps Professor and Director of the Department of Psychiatry, Johns Hopkins University, Baltimore. Cloth. Price, \$3. Pp. 362. New York: Macmillan Company, 1941.

At a time when the seriousness of the problem of addiction to alcohol is beginning to be realized and approached scientifically, it is deplorable that pseudoscientific attitudes should be placed before the public. This book, although written by a physician and psychiatrist, seems to be a moralizing treatise on the evils of alcohol, smoking and overeating, with little scientific flavor. The author's thesis as to the etiology of alcoholism might be condensed into three main factors: (1) the high speed and tension of modern living, (2) inherited neuroticism or defective constitution and (3) overindulgent upbringing. There is much discussion of defective blood-brain barriers, inherited defective nervous system, hormone dysfunction and synapse dysfunction to explain the alcoholic addict's apparent sensitivity to alcohol. There is little psychologic understanding. The author objects strenuously to the use of alcohol even medicinally; he also objects to any drug-containing food or beverage in the life of the right living person and inveighs repeatedly against coffee, tea, cocoa, cigars and soft drinks containing caffeine. He is convinced that chronic self intoxication and toxicity through overeating and eating too many sweets is at the bottom of much emotional maladjustment. His treatment program, as far as one can abstract it, comprises institutionalization, tapering off and then complete abstinence from alcohol and tobacco, occupational and recreational therapy, careful diet and health building, and psychotherapy. Return of the impulse to drink is countered with a dose of castor oil and a meatless meal, then perhaps a second dose if the impulse has not departed. The psychotherapy—which apparently is done by teachers or psychologists—involves much ethical discussion, reeducation and exhortation. The author refers vaguely to "analysis" but certainly does not mean psychoanalysis.

**Brucellosis or Bang's Disease of Farm Animals.** By C. P. Fitch and W. L. Boyd. University of Minnesota, Agricultural Experiment Station, Bulletin 348. Paper. Pp. 32, with 12 illustrations. St. Paul, 1940.

This bulletin was prepared primarily for distribution to veterinarians, dairymen and farmers, but it contains much information of interest and value to physicians. The widespread incidence of brucellosis in human beings has caused physicians to give heed to the manner in which brucellosis may be prevented and controlled in cattle. The excellent work of Dr. Fitch and his associates at the Agricultural Experiment Station of the University of Minnesota, St. Paul, in the control of brucellosis (Bang's disease) of cattle and swine is well known to students of brucellosis in human beings. It is to be deeply regretted that Dr. Fitch died in January 1940 while the manuscript of this publication was being prepared. Fitch and Boyd have found that approximately 12 per cent of the cattle tested in Minnesota are positive reactors to the agglutination test for brucellosis. They have found this test to be a safe, reliable and practical method of diagnosis of brucellosis in cattle. It has exhibited an efficiency in excess of 95 per cent. Too much reliance should not be placed on a single negative test, especially if there is evidence of active infection in the herd or if the blood sample is taken a few days before or after a calving or abortion. The federal-state plan for the elimination of brucellosis and the establishment of brucellosis free accredited herds is making good progress, and cattle owners are becoming more and more aware of the economic advantages of ridding their herds of Bang's disease. Reasonable indemnity payments are made by matched federal and state funds. Retesting of a herd should be done not more than thirty to sixty days after the first tests were made. Blood testing should be continued preferably at ninety day intervals until the herd has passed three entirely negative tests. A single negative test is not conclusive proof of the absence of brucellosis. The introduction of diseased females into healthy herds is the most common method of spreading the disease

from one herd to another. Additions made to the herd should be from herds tested and known to be free from Bang's disease. Pregnant animals should be kept in quarantine for at least ninety days after calving before being introduced into the herd and then only after the blood test is known to be negative. Vaccination of calves with a living vaccine of reduced virulence for the control of this disease in cattle is still in the experimental stage. All milk and milk products used in the feeding of negative herds should be from brucellosis free cattle or should be pasteurized. Milk from positive reactors is a dangerous source of spread of the disease, both to other cattle and to human beings. Bulls in brucellosis free herds should be used for service only on cattle that have been tested and found free from Bang's disease. Progressive breeders and milk producers are now fully aware that their herds must be free from brucellosis in order to realize the maximum financial return. The control of Bang's disease by area testing at present is the most satisfactory method for the control of this infection.

**Hygiene: A Textbook for College Students on Physical and Mental Health From Personal and Public Aspects.** By Florence L. Meredith, B.Sc., M.D., Professor of Hygiene, Tufts College, Boston. Foreword by Frank Howard Lahey, M.D., D.Sc., LL.D., President-Elect, American Medical Association. Third edition. Cloth. Price, \$3.50. Pp. 822, with 184 illustrations. Philadelphia: Blakiston Company, 1941.

The present edition of this well known textbook has been completely rewritten and, as with the previous editions, has been prepared especially for the college student. The theme which the author states she has tried to carry throughout the book is a discussion of the health situation which exists in the life of individuals and peoples, what health objectives arise from them and what action is scientifically appropriate on the part of the layman. This theme is introduced with an excellent general discussion of the health situation and trends in the United States, as evidenced by a study of the vital statistics of this country. About one half of the book is devoted to a consideration of the hygiene of the individual. This includes the usual discussion of circulation, digestion, respiration and reproduction. There is great detail on the anatomy and physiology of each of the systems of the body as well as the principles of hygiene relating to each system. For the college student much of this detail seems unnecessary and elementary. Because of such detail the book is more voluminous than the average college hygiene program can cover. The material on infection and resistance is well presented, and there is an excellent discussion of scientific medical practice compared to the practice of the cults. On the whole, the book is one of the most comprehensive treatments of the subject of hygiene that have been published. It would make an excellent reference book for the teacher of hygiene in the elementary and secondary school. For the use of college students it would have been more usable had there been omitted some of the detailed anatomy and physiology.

**Diagnostic Procedures and Reagents: Technics for the Laboratory Diagnosis and Control of the Communicable Diseases.** Cloth. Price, \$2.75. Pp. 352, with illustrations. New York: American Public Health Association, 1941.

This new book on technics for the laboratory diagnosis and control of the communicable diseases is the result of a seven year survey of the best laboratory methods now available for the recognition and control of the communicable diseases. The work was begun in 1933 by a special committee of the American Public Health Association on the preparation of reagents and the description of methods used in the public health laboratory. Those persons best qualified to describe the various procedures were selected as referees. The book marks the beginning of a development which should have an important influence on medical and administrative practice in the field of communicable disease control.

There are fifty pages by Arthur Parker Hitchens on culture mediums, stains, reagents and solutions. This chapter includes a list of sixty-six references. There are nine pages by Edmund K. Kline on the toxicity of dyes for certain bacteria. The next chapter, of twenty-four pages, on the meningococcus is written by Sara E. Branham of the National Institute of Health. There are twenty-six pages on the gonococcus by Charles M. Carpenter.

Tularemia is presented by James G. McAlpine and George D. Brigham in fourteen pages. Brucellosis, in twenty pages, is described by Arthur Parker Hitchens and Frances Sullivan. Then come chapters on *Haemophilus pertussis* by Pearl Kendrick and George McL. Lawson (eighteen pages), the pneumococcus by Elliot S. Robinson (twenty pages), hemolytic streptococci by Julia M. Coffey (fifteen pages), bacterial food poisoning by Stewart A. Koser (seventeen pages), typhus fever and other Rickettsial infections by Henry Welch (ten pages), Eberthella typhosa and other bacillary incitants of enteric disease by Marion B. Coleman (twenty pages), the diphtheria bacillus by Martin Frobisher (thirty pages), the tubercle bacillus by A. L. MacNabb (twelve pages), examination of specimens for *Spirochaeta pallida* by Ruth Gilbert (three pages), serodiagnosis of syphilis by Ruth Gilbert and Elizabeth Maltaner (twenty pages), examination of cerebrospinal fluid for evidence of syphilis of the central nervous system by Ruth Gilbert (three pages), rabies by T. F. Sellers (fourteen pages), and pathogenic fungi by W. D. Stovall and Lois Alman (seventeen pages). There is a sixteen page index.

This new book is the best and most authoritative publication on the laboratory diagnosis of the communicable diseases. It is safe to predict that it will soon be found in the hands of all laboratory workers interested in the diagnosis and prevention of the communicable diseases.

**Progress of Scientific Research in the Field of the Exceptional Child.** Proceedings of the Sixth Institute on the Exceptional Child of the Child Research Clinic of the Woods Schools, a Private School for Exceptional Children at Langhorne, Pa., Tuesday, Oct. 24, 1939. Paper. Pp. 64, with illustrations. Langhorne, [n. d.].

This pamphlet is a report of the proceedings of the Sixth Institute on the Exceptional Child, conducted by the Child Research Clinic of the Woods Schools, a private school for exceptional children at Langhorne, Pa. Although the institute was held in October 1939, the pamphlet was not received for review until Jan. 17, 1941.

The program consisted of a morning and afternoon session, during which five papers were presented with the following titles and authors:

The Child, The Savage, and Human Experience  
A. Irving Hollowell, Ph.D.  
University of Pennsylvania.

What Is An Exceptional Child?  
W. E. Bhatz, Ph.D.  
University of Toronto.

The Interplay Between Intellectual and Emotional Factors in Personality Diagnosis.  
Bruno Klopfer, Ph.D.  
Rorschach Institute, New York.

A Method for the Study of Personality Reactions in Preschool Age Children by Means of Analysis of Their Play.  
J. Louise Despert, M.D.  
Payne Whitney Psychiatric Clinic  
New York Hospital, New York.

A Special School Looks at Special Education.  
Charles M. Morris, Ph.D.  
Woods Schools, Langhorne, Pa.

The papers are presented apparently in full, with extensive bibliographic notations. A specimen chart of the Rorschach method, which is a projective method for the study of personality, is attached.

This publication should be useful and interesting to physicians and psychologists interested in the exceptional child.

**The Comparative Physiology of Respiratory Mechanisms.** By August Krogh. Publication of the William J. Cooper Foundation. Cloth. Price, \$3. Pp. 172, with 84 illustrations. Philadelphia: University of Pennsylvania Press; London: Oxford University Press, 1941.

This volume is an outgrowth of a series of lectures delivered at Swarthmore College in 1939 and represents an important contribution to the physiology of respiration. Professor Krogh has put together in his inimitably simple and interesting way a review of his own and others' work on respiratory mechanisms in numerous forms of animal life. Although the book is full of detailed information, as would be evident from the illustrations and tables, the description of how respiratory mechanisms of diverse types meet the peculiar needs of animals in various environmental situations is easy and fascinating reading. In describing respiratory mechanisms involving (1)

simple diffusion in small aquatic forms, (2) water lungs, (3) branchial water gills, (4) air breathing gills, (5) diffusion lungs and (6) ventilation lungs, the author has covered the comparative physiology of external respiration. Many ingenious devices for studying such respiratory mechanisms are described. A comprehensive section covers the mechanisms in aquatic mammals, in which great pressure differences come into play. Another valuable section of the book considers the gas transporting mechanisms of the blood in hemoglobin and hemocyanin containing forms, including the adaptations to high altitude, to low oxygen tension and to high pressures. The book brings together a wealth of material from obscure sources of great value in understanding better the respiratory mechanism in man.

**A Review of the Psychoneuroses at Stockbridge.** By Gaylord P. Coon, M.S., M.D., Chief Medical Officer, Boston Psychopathic Hospital, Boston, and Alice F. Raymond, A.B., Statistician, Department of Child Hygiene, Harvard School of Public Health, Boston. Cloth. Pp. 299. Stockbridge, Massachusetts: Austen Riggs Foundation, Inc., 1940.

This book is an analysis of cases treated at Stockbridge between 1910 and 1934. In the twenty-five year period the effect of changing therapy is apparent. The clinical records have been amplified by correspondence and follow-up visits. The individual case reports are few, but 1,060 cases out of 5,300 were reviewed. In general, the patients were psychoneurotic, for Dr. Riggs' practice was confined to this type of patient for many years. When the Riggs Associates was formed in 1937, it carried on the work of the Austen Riggs Foundation, which had been established in 1917 for the service of patients who were unable to pay the usual fees of private psychiatrists. Miss Raymond and Dr. Coon describe the limitations of the psychoneurotic and of the classification of "psychoneurosis" early in the book. They discuss the difficulties of differential diagnosis and the methodology of treatment at Stockbridge. There the feeling has been strong that (a) a balance of the day's activity, (b) the habit of accepting reality, (c) the habit of living in the present and (d) a consistent purpose expressed in useful work are ideals which are of maximum importance in directing a patient to a resumption of an integrated behavior pattern. Reeducation at Stockbridge appears to have a place midway between the persuasive method of Dubois (so called) and the psychobiologic approach of Adolf Meyer. The book testifies to the perception and analytic skill of the authors.

**Las artritis gonocóceas agudas: Su diagnóstico y tratamiento médico.** Tesis de doctorado de Enrique A. A. Pierini. Universidad nacional de Buenos Aires, Facultad de ciencias médicas, N.º 5334. Paper. Pp. 339, with 52 illustrations. Buenos Aires: Imprenta de Alfredo Frascoli, 1940.

The author selected the subject of diagnosis and medical treatment of acute gonorrheal arthritis for his doctoral thesis. The various chapters cover clinical forms, symptoms, course, diagnosis, prognosis and pathologic anatomy of acute gonorrheal arthritis; clinical, roentgen and differential diagnosis and the various methods of medical, surgical and physical treatments, vaccines and local antigonorrheal serotherapy. The sixth chapter is a report of clinical results obtained from local antigonorrheal serotherapy. The book ends with forty-five pages of bibliography.

**Urban Housing and Crowding: Relation to Certain Population Characteristics as Indicated by National Health Survey Data.** By Rollo H. Britten, Senior Statistician, and J. E. Brown, Assistant Statistician, U. S. Public Health Service. From the Division of Public Health Methods, National Institute of Health. Prepared by direction of the Surgeon General. Federal Security Agency, U. S. Public Health Service. Public Health Bulletin No. 261. Paper. Price, 15 cents. Pp. 123, with 5 illustrations. Washington, D. C.: Supt. of Doc., Government Printing Office, 1941.

The obvious is thoroughly demonstrated by diagrams and statistics in this study. It is proved beyond doubt that crowding is much worse in the lower than in the higher income class, among Negroes rather than white persons, with large families more than small, in residencies with low rentals rather than high, in rented greater than in owner occupied, and in general was less in the West than in the Northeast and South. Possibly a housing program might find some of these figures valuable, but they certainly reveal nothing new.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### STERILIZATION OF CATGUT

To the Editor:—What solutions are commonly employed inside the ampules which contain suture material? Are any of them to be particularly recommended? Have any of them been condemned? I have often noticed a smell of benzene when breaking such an ampule. What is the origin of this odor? Does the ampule contain free benzene? I notice in Johnson and Johnson's advertisements that they use 95 per cent alcohol with potassium mercuric iodide. Is either the alcohol or the mercuric salt capable of irritating tissues? Do you have a record of the solution employed at the present time by Bauer and Black? Is there a listing of approved sutures? What is the difference between boilable and non-boilable sutures? What would happen if one were to boil a nonboilable suture?

Percy J. Delano, M.D., Chicago.

ANSWER.—These questions cannot be answered satisfactorily without reference to the fundamental problem of the sterilization of catgut. It has been abundantly demonstrated that chemical agents alone cannot be relied on to sterilize catgut; heat must be used, and in a manner which will not spoil the material for surgical purposes.

"Boilable" catgut is first dehydrated, is then placed in sealed glass tubes containing an inert, anhydrous liquid, and finally is subjected to high temperature for long periods (e. g. 165 C. for five hours). The tubing fluid ordinarily used for this type of gut is xylene (dimethylbenzene) or toluene (methylbenzene), since both of these substances possess desirable qualities of colorlessness, stability, volatility and low toxicity (Bauer and Black use pure xylene or toluene for "boilable" catgut, and 95 per cent alcohol denatured with agents such as potassium mercuric iodide or phenyl mercuric benzoate for "nonboilable" catgut). Boiling or autoclaving these tubes before operation does not injure the enclosed gut and is recommended for the purpose of sterilizing the outer surface of the glass. It is a mistake, however, to think that any lack of sterility within the tubes can be rectified by such procedures, for temperatures of 120 C. or less for fifteen to twenty minutes cannot be depended on to kill sporulating organisms suspended in inert anhydrous mediums. This is one reason why it is imperative that all tubed catgut on the open market should be unquestionably sterile. When "boilable" catgut has been removed from its tube, the liquid quickly evaporates, leaving the strand perfectly dry and rather stiff. A desirable degree of pliability may be restored slowly by immersing the gut in 95 per cent alcohol, more rapidly by dipping it in physiologic solution of sodium chloride, and most rapidly of all by using first alcohol and then salt solution. This softening, which is due to the taking up of water by the dehydrated gut, may reduce the tensile strength slightly; but it is a process which occurs anyhow as soon as the catgut is buried in tissues.

The advantage claimed for "nonboilable" catgut is that the strand comes from the tube already soft and pliable. More steps are required in its manufacture, however, which of necessity increase the difficulty of producing a uniformly sterile suture material. The accepted method is to dehydrate the gut, sterilize it in open tubes by heat in an anhydrous medium such as cumene, drain off this liquid, add an antiseptic fluid and finally seal the tubes hermetically. The tubing fluid ordinarily used for "nonboilable" catgut is 95 per cent alcohol containing potassium mercuric iodide or some similar denaturing agent. In case of catgut affixed to needles in the tube at least one company (Davis & Geck) uses as tubing fluid anhydrous ethyl alcohol containing 0.5 per cent benzene and 0.2 per cent thymol. Irritation of tissues by these chemicals is probably unusual, especially if the catgut is rinsed in salt solution before use. "Nonboilable" catgut should not be boiled, because "the collagen of the suture in the presence of moist heat is partially converted into gelatin, thereby destroying the tensile strength and rendering the suture brittle" (Manual of Surgical Sutures and Ligatures, Brooklyn, Davis & Geck, Inc., 1935). It is necessary therefore to attempt to disinfect the outside of "nonboilable" catgut tubes by submerging them for adequate periods in germicidal solutions.

Beginning Jan. 1, 1941 the Federal Food and Drugs Administration assumed control over sterile surgical supplies (including catgut) manufactured for sale (Meleney, F. L.: Sterile Surgical Supplies, editorial, *Surgery* 8:884 [Nov.] 1940). Offi-

cial standards for sterility of catgut are indicated in the latest Supplement of the U. S. Pharmacopeia (Second Supplement to the Pharmacopeia of the United States, Eleventh Decennial Revision, Easton, Pa., Mack Printing Company, 1919, pp. 40 and 124). Efforts are being made to have these standards extended to include qualities of tensile strength and absorbability. Perhaps this will lead to further standardization of tubing fluid also. It is already required that each package of catgut shall state "the lot number identifying the methods and the time of sterilization of the gut, and the composition of any tubing fluid used." But as yet there is no official listing of approved sutures or of those firms whose catgut measures up consistently to the standards already established (Brewer J. H.: The Present Status of the Sterility of Catgut Sutures on the American Market, *THE JOURNAL*, Feb. 27, 1937, p. 722).

### TREATMENT OF SEROLOGICALLY NEGATIVE SYPHILIS IN PREGNANCY

To the Editor:—A white woman aged 30, a primigravida, had a chancre and secondary rash in 1932. Blood tests for syphilis gave positive results at that time. The patient had intensive treatment with arsenicals and bismuth compounds (exact amounts not known) from 1932 until 1935 by a competent dermatologist. Her blood serum and spinal fluid became normal and have remained normal since 1935. At the present time she is two and one-half months pregnant. The Kahn, Kline and Wassermann reactions of the blood are all negative. The Kahn, Kline and Wassermann reactions as well as the colloidal gold reaction of the spinal fluid are negative. There are 1 to 2 cells per cubic millimeter of spinal fluid. Protein is not increased by the Pandy test. There are no clinical or neurologic signs of syphilis. Should this patient receive antisyphilitic therapy? If so, what type? What are the reasons for this recommendation? As a corollary to this, what is the rationale for the statement "A syphilitic woman should have treatment during each and every pregnancy, regardless of the serology and state of the disease?"

M.D., Nebraska.

ANSWER.—The patient has apparently had good treatment in the past for her syphilis, and the chances are good that even if she was not to have treatment there would be no difficulty.

The situation with a pregnancy, however, is somewhat different from what it is with the ordinary contacts in life, even sexual intercourse. It is generally understood that a biologic cure in syphilis probably is extremely difficult. A clinical cure and even a cure of the disease to such an extent that laboratory tests will no longer show any evidence of the disease is not out of the question. However, it is possible that such patients may still have a few stray organisms lodged away somewhere in the haversian canals or in some of the lymph nodes, and under the unusual stimulation that goes on in connection with a pregnancy it might be possible that a few of these organisms would get into the blood stream, and through the intimate contact between the fetus and the mother, by way of the placenta, it would be possible for some of them to lodge in the placenta and be carried through into the circulation of the fetus.

It is for this reason that the patient should have antisyphilitic treatment throughout her pregnancy.

Perhaps some time in the future sufficient statistical data will have been gathered to show that this is not necessary. Thus far, however, it has not been done.

A patient like the one described may be given a course of injections of mapharsen, each 40 mg., given once a week for a period of ten treatments. This may be followed with a short course of intramuscular injections of bismuth subsalicylate and a course of injections of mapharsen, the treatment being given right up until delivery.

### ALLERGY AND EPINEPHRINE SENSITIVITY

To the Editor:—A patient with asthma is sensitive to many things: house dust, orris root powder, oranges and other substances. One cc. of epinephrine is the only thing which relieves her asthma. Three months ago she received four injections of 1 cc. of epinephrine with only slight palpitations of short duration. On March 1 another attack of asthma occurred. I gave her 1 cc. of epinephrine. (I am sure the injection was not in a blood vessel, as I always pull the plunger before giving an injection.) Such severe palpitations developed that it was hard for her to breathe. They lasted one and one-half hours until finally I gave her pentobarbital sodium and the palpitations subsided. I do not dare to give her epinephrine. Ephedrine does not help her.

M.D., Michigan.

ANSWER.—The inquiry does not give sufficient information regarding the full details of the patient's allergy; i. e., the history in detail and a complete study made including complete cutaneous tests, for a thorough answer regarding management. In general, those things which have been mentioned of an environmental nature, house dust and orris root, can and should be eliminated by the use of cosmetics free from orris root and of impervious covers over the mattress and pillows. Other precautions against house dust, especially in the bedroom, by



the elimination of drapes and upholstered furniture, should likewise be taken. It may be necessary to treat with those environmental substances to which the patient is sensitive and which cannot be thoroughly eliminated. It is presumed that the foods to which the patient reacts and to which she is clinically sensitive have been eliminated from her diet. As for the reaction described to injections of epinephrine, the amount given with each injection, 1 cc., is in most cases considered excessive. Generally speaking, 0.3 to 0.5 cc. of a 1:1,000 solution of epinephrine is all that should be given. If no relief is obtained from that dose, none will usually be obtained from a larger dose. All that will result from giving a larger dose are the undesirable side effects of epinephrine which are partly described in this case. It is not uncommon if a patient is in contact with a substance to which he is sensitive to find that epinephrine fails to give relief. Thus a patient sensitive to feathers, sleeping on unprotected feather pillows, will have no relief from solution of epinephrine. This is likewise true of many pollen-sensitive patients during the season for pollen. It might be well to try, for relief in this case, epinephrine in oil or epinephrine in gelatin; 0.5 cc. of either of these two solutions may be injected deep, subcutaneously or intramuscularly. For better results, 0.2 to 0.3 cc. of an aqueous solution of epinephrine (1:1,000) may be used immediately preceding the oil or gelatin suspension of this drug. If this is done, the injections are given separately and at different sites. Generally, if aqueous solution of epinephrine fails to give relief the oil suspension likewise fails to give relief. Another suggestion in severe attacks if epinephrine does not work is the slow intravenous administration of  $7\frac{1}{2}$  grains (0.5 Gm.) of aminophylline.

#### PYORRHEA ALVEOLARIS

*To the Editor:*—What is the cause of pyorrhea alveolaris? In a fairly well advanced case with recession of the jawbone but with no dental or gingival symptoms, is there any local treatment or general treatment that might arrest the progress of the disease? Are calcium and vitamin D of any avail?

Angeline Mary Piscitelli, M.D., San Francisco.

**ANSWER.**—The causes of pyorrhea alveolaris are generally unknown, but it is suspected that a combination of local trauma or irritation and a subclinical systemic deficiency of unknown type may be etiologic factors.

In the absence of dental or gingival symptoms the implication is that the cause may be chiefly systemic. However, studies on calcium and ascorbic acid in the blood, as well as other blood chemistry, have generally failed to show deviation from the normal.

Slight but gradual recession of the gums and alveolar bone is a normal senile change in older persons, associated with the continuous though slow eruption of the teeth. It should not be confused with pyorrhea alveolaris (periodontoclasia). The age of the patient is therefore important in the diagnosis.

Local treatment consisting of thorough sealing and removal of all irritating factors, such as calculus and detritus, is always indicated, as well as thorough medical examination and dietary analysis. Unfortunately this procedure is frequently not effective. Calcium and vitamin D therapy are indicated only when the systemic condition warrants such treatment. Surgical resection is not indicated in the absence of gingival symptoms.

#### HEMOGLOBIN DETERMINATION BY SANFORD-SHEARD METHOD

*To the Editor:*—What is the accepted value of normal blood by the Sanford-Sheard method of hemoglobin determination expressed as the amount in grams per hundred cubic centimeters of blood?

J. A. Mease Jr., M.D., Dunedin, Fla.

**ANSWER.**—The Sanford-Sheard instrument reads in grams of hemoglobin per hundred cubic centimeters. It is checked by the oxygen capacity method of determining hemoglobin and so should give the same readings as other accurate standard procedures. Several large series of hemoglobin determinations in normal persons have been reported with little variation in the average results. These run from 15 to 16 Gm. per hundred cubic centimeters. Sanford has stated that 16 Gm. is his average value.

In any method of determining hemoglobin the most satisfactory procedure is to determine for each laboratory the average value of hemoglobin in grams per hundred cubic centimeters for a normal red cell count of 5 million by the method used. This can be done accurately enough for all practical purposes by the careful study of at least 10 normal persons. The figure so determined is then taken as 100 per cent. The color index using this figure as 100 per cent should be 1.00 within the limits of error in normal persons.

#### ULTRAVIOLET RAYS AND THE SKIN

*To the Editor:*—Is there any danger from regular and repeated use of ultraviolet rays long enough to cause mild reddening of the skin followed by desquamation? A woman aged 29 had benefit to a cutaneous eruption with the General Electric sunlamp. The eruption appears as single pustules resembling acne, leaving a faint pitting. Pustules and pitting have been benefited. Eller and Walff's article on skin peeling in *The Journal* seems to explain the action.

M.D., Maine.

**ANSWER.**—One of the chief functions of the human skin is protection of the underlying tissues against the action of light. Normal skin is able to do this without being injured by the light, even though it is rather intense, provided the intensity comes on gradually. Repeated mild erythema doses of ultraviolet rays will not harm it. Only skins which are defective and lack the power of developing resistance to light can be harmed by such exposure. Such skins can usually be recognized by their inability to form pigment, freckling instead of tanning. These should not be exposed to strong light if it can be avoided, for fear that senile keratoses will develop, which are often the precursors of epithelioma. Such skins are not common. The patient mentioned in the query evidently profits by the treatment and there is little likelihood of injury.

#### EARLY TABES OR MENINGOVASCULAR SYPHILIS

*To the Editor:*—A man aged 43 has 3 plus blood and 4 plus spinal fluid Wassermann reactions after having had over thirty nearsphenamine, sixty bismuth and recently over ten tryarsamide injections. His pupils are unequal and do not react to light. His knee jerk reflexes react sluggishly; the blood pressure is 100 over 70; no cardiovascular abnormalities are demonstrable. He has no complaints other than fatigue and insomnia. He refuses malaria fever therapy as well as any further spinal tests. What therapy can be used to prevent progression of his disease if not a cure? How much tryarsamide may be used in this type of case—for how long and should one allow rest periods? Are iodides of any value and, if so, what dosage?

Irving I. Crause, M.D., Buffalo.

**ANSWER.**—If the patient's pupils are unequal and do not react to light and the reflexes are sluggish, he has symptomatic rather than asymptomatic neurosyphilis. Whether he has early tabes dorsalis or meningovascular neurosyphilis cannot be determined from the information furnished. If the spinal fluid is showing a severe degree of involvement, that is, the so-called parietic formula, the patient, barring contraindications, should have fever therapy. In view of his refusal to undergo such treatment, the continued use of tryarsamide and bismuth compounds is warranted. These drugs may be given concurrently, ten injections of each to a course, with a two month rest interval between courses, and effort should be made to give at least seventy-five injections of each drug. The use of iodides is advisable, giving up to 50 minims (3 cc.) three times a day if tolerated, otherwise maintaining as high a dose as the patient can comfortably take.

#### CONVALESCENT SCARLET FEVER SERUM

*To the Editor:*—In *The Journal*, Feb. 8, 1941, in the article "Chemotherapy of Infectious Diseases and Other Infections, Circular Letter 81," under Medical Preparedness, I notice the omission of the use of convalescent scarlet fever serum in the prevention and treatment of scarlet fever. Why do the "authorities" omit convalescent scarlet fever serum from the circular letter?

Harry G. Rotman, M.D., Josanville, Ind.

**ANSWER.**—Convalescent scarlet fever serum was not included in circular letter 81 because its prophylactic use was not considered feasible in large numbers of persons and its field of therapeutic usefulness is still limited by the available supplies.

It is questionable whether widespread prophylaxis in scarlet fever is practicable in army camps, and there seems to be no great advantage for convalescent serum over the commercial serums which are now on the American market. This entire question, however, is subject to later modification if the evidence warrants.

#### CITRATES AND CORONARY THROMBOSIS

*To the Editor:*—I am puzzled by an answer to a query in the March 29, 1941, issue of *The Journal*. To the question of whether citrates were helpful in coronary thrombosis the answer was that the anticoagulant properties of the citrate radical were nullified. Since when does the citrate radical have such properties? So far as I know in regard to calcium and citrate the calcium radical is the determining one in blood coagulation. With the formation of a "relatively insoluble calcium citrate" less calcium is available for coagulation and hence coagulation is decreased. In the experiments in which sodium citrate was shown to increase coagulation, concentrations of 10 per cent were used. Concentrations of citrate over 3 per cent given intravenously may be toxic perhaps because of the destruction of platelets. In 2 per cent solution sodium citrate by vein decreases blood viscosity. (Bernheim, Alice R., and London, Isobel M.: Arteriosclerosis and Thromboangiitis Obliterans, *The Journal*, June 19, 1937, p. 2102). We have recently found that sodium citrate by mouth does increase citric acid in the blood.

Alice R. Bernheim, M.D., New York.

# The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 116, No. 25

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CHICAGO, ILLINOIS

JUNE 21, 1941

## THE DIAGNOSIS AND TREATMENT OF ACHYLIA PANCREATICA

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C. ROBERT SCHMIDT, PH.D., M.D.  
AND  
A. C. IVY, PH.D., M.D.  
CHICAGO

Studies on the effect of achylia pancreatica on digestion and absorption in experimental animals have been numerous and consistent. It has been clearly demonstrated that exclusion of pancreatic juice from the intestine results in a decided increase in the quantity of fat and nitrogen,<sup>1</sup> starch<sup>2</sup> and the total carbohydrate<sup>3</sup> eliminated in the feces. In view of the uniformity of these results, the negative results reported by some of the older workers<sup>4</sup> can be attributed to a simple failure to exclude all pancreatic juice from the intestine.<sup>5</sup>

Reports on the value of substitution therapy in experimental achylia pancreatica have not been entirely harmonious. Pratt, Lamson and Marks,<sup>5</sup> Cruickshank,<sup>6</sup> Nasset, Pierce and Murlin,<sup>7</sup> Selle<sup>8</sup> and Schmidt, Beazell, Crittenden and Ivy<sup>9</sup> all observed a significant reduction in the quantity of nitrogen wasted in the feces

The Wilson Laboratories, Chicago, supplied the pancreatin used throughout this study.

From the Department of Physiology and Pharmacology, Northwestern University Medical School.

Dr. Paul Wosika of Chicago, Dr. H. T. Rickett of Billings Hospital, University of Chicago, and Dr. D. R. Cunningham of Winnetka, Ill., each placed at our disposal 1 patient.

1. Brugsch, T.: Äussere Pankreasfunktion und Pankreasdiagnostik, Ztschr. f. exper. Path. u. Therap. 20:473, 1919. Licht, H., and Wagner, A.: Gibt es ein die Fettresorption förderndes inneres Sekret des Pankreas? Klin. Wchnschr. 6:1982 (Oct. 15) 1927. Maltby, E. J.: Utilization of Ingested Protein by Depancreatized Dogs, Proc. Roy. Soc. Canada 25:203, 1931. Pratt, Lamson and Marks,<sup>5</sup> Cruickshank,<sup>6</sup> Nasset, Pierce and Murlin,<sup>7</sup> Handelsman, Golden and Pratt,<sup>3</sup> Selle,<sup>8</sup> Schmidt, Beazell, Crittenden and Ivy,<sup>9</sup> Coffey, Mann and Bollman.<sup>10</sup>

2. Beazell, J. M.; Schmidt, C. R., and Ivy, A. C.: On the Effectiveness of Orally Administered Diastase in Achylia Pancreatica, J. Nutrition 13:29 (Jan.) 1937.

3. Handelsman, M. B.; Golden, L. A., and Pratt, J. H.: The Effect of Variations in the Diet on the Absorption of Food in the Absence of Pancreatic Digestion, J. Nutrition 8:479 (Oct.) 1934. Coffey, R. J.; Mann, F. C., and Bollman, J. L.: The Influence of the Pancreas on the Utilization of Food Stuffs, Am. J. Digest. Dis. 7:144 (April) 1940.

4. Rosenberg, S.: Ueber den Einfluss des Pankreas auf die Resorption der Nahrung, Arch. f. d. ges. Physiol. 70:371, 1898. Niemann, A.: Die Beeinflussung der Darmresorption durch den Abschluss des Pankreassaftes, Ztschr. f. exper. Path. u. Therap. 5:466, 1908. Fleckseder, R.: Ueber die Rolle des Pankreas bei der Resorption der Nahrungstoffe aus dem Darne, Arch. f. exper. Path. u. Pharmacol. 59:407, 1908.

5. Pratt, J. H.; Lamson, P. D., and Marks, H. K.: The Effect of Excluding Pancreatic Juice from the Intestine, Tr. Am. Physicians 24:266, 1909.

6. Cruickshank, E. W. II.: The Effect of Depancreatization on Digestion, Biochem. J. 9:138, 1915.

7. Nasset, E. S.; Pierce, H. B., and Murlin, J. R.: The Influence of Yeast on Protein Metabolism in Normal and Depancreatized Dogs, J. Lab. & Clin. Med. 16:1151 (Sept.) 1931.

8. Selle, W. A.: The Effect of Enteric-Coated Pancreatin on Fat and Protein Digestion of Depancreatized Dogs, J. Nutrition 13:15 (Jan.) 1937.

9. Schmidt, C. R.; Beazell, J. M.; Crittenden, P. J., and Ivy, A. C.: The Effect of the Oral Administration of Pancreatin on Fecal Nitrogen and Fat Loss in Achylia Pancreatica, J. Nutrition 14:513 (Nov.) 1937.

when adequate substitution therapy was instituted. Coffey, Mann and Bollman,<sup>10</sup> on the other hand, were unable to demonstrate any specific effect. In agreement with Selle<sup>8</sup> the latter authors also found that enzyme therapy was without effect on the quantity of fat wasted in the feces. In contrast, Schmidt, Beazell, Crittenden and Ivy,<sup>9</sup> Pratt, Lamson and Marks<sup>5</sup> and Cruickshank<sup>6</sup> all reported that oral enzyme therapy had a decidedly favorable effect on fat utilization. We<sup>2</sup> found that substitution therapy effected reductions in fecal starch as great as 50 per cent. Coffey, Mann and Bollman<sup>10</sup> obtained similar results in studies on the utilization of total carbohydrate.

Clinical studies on the effect of achylia pancreatica on food utilization and on the effect of enzyme therapy have been surprisingly consistent. With few exceptions it has been reported that achylia pancreatica is characterized by a noticeable failure in the absorption of both fat and nitrogen and that substitution therapy is of demonstrable therapeutic value. Observations on certain well studied cases reported in the literature, in which the effect of substitution therapy was determined, are summarized in table 1. The results obtained during control periods illustrate the magnitude of the disturbance in digestion and absorption that occurs when pancreatic juice is excluded from the intestine in man.

Since the number of well studied patients are few, and since oral pancreatic enzyme therapy in man is not generally considered to be of value, a view that is inconsistent with most of the results of animal experimentation, we have undertaken to determine the effectiveness of oral pancreatic enzyme therapy in human patients with achylia pancreatica.

We have carefully studied 4 patients in whom a definite diagnosis of achylia pancreatica has been established and have observed the effect of the oral administration of pancreatic enzymes on them for from a few months to three and a half years.

### BRIEF HISTORIES OF THE PATIENTS STUDIED

The following brief reports include the significant information gained from the history and the examinations made prior to our study:

CASE 1.—W. M., a white woman aged 65, in August 1938 complained of frequent bulky stools, loss of 22 pounds (10 Kg.) and extreme inanition. The symptoms had originated insidiously about nine years earlier. She had been under treatment for diabetes mellitus since 1931, but in spite of satisfactory control of the diabetes (insulin 15-5-15 units) she had continued to lose weight and strength.

Aside from emaciation and irregular, sluggish pupils, physical examination gave essentially negative results. Urinalysis revealed sugar ++, pus cells ++ and albumin a trace. The

10. Coffey, R. J.; Mann, F. C., and Bollman, J. L.: Substitution Therapy in Experimental Pancreatic Deficiency, Am. J. Digest. Dis. 7:149 (April) 1940.

red blood cell count was 4,130,000, the hemoglobin content 11 Gm. and the white blood cell count 8,000. The Wassermann reaction of the blood was +++ and of the spinal fluid negative. She had received intensive antisyphilitic therapy nine years and a course of bismuth two years prior to our study. The dextrose tolerance curve was of the diabetic type. Gastrointestinal roentgenograms revealed no abnormalities.

CASE 2.—B. D., a white man aged 62, in July 1940 complained of frequent bulky stools, loss of 40 pounds (18 Kg.), and weakness. These symptoms had developed insidiously during the summer of 1939. Diabetes mellitus, diagnosed in June 1940, had been readily controlled with moderate dietary restrictions and protamine zinc insulin 10 units before breakfast.

Aside from the evidences of loss of weight, physical examination gave essentially negative results. The urine contained albumin ++ but was otherwise normal. The red blood cell count was 4,350,000, the hemoglobin content 12.4 Gm. and the white blood cell count 8,500. The Wassermann reaction was negative. Roentgenograms of the abdomen revealed extensive calcification in the region of the pancreas.

CASE 3.—W. E., a white man aged 63, in June 1937 complained of loss of weight (35 pounds, or 16 Kg.), moderate weakness and frequent bulky stools. In May 1934 the patient had had a severe acute illness diagnosed as acute pancreatitis. About one year later, in the absence of other symptoms, an increase in the frequency and volume of the stools followed by loss of weight and strength occurred. At the time of the change in the character of the stools a roentgenologic diagnosis of pancreatic calculi was made.

Aside from the evidence of loss of weight, physical examination and urinalysis revealed no abnormalities. The red blood cell count was 4,850,000, the hemoglobin content 14.3 Gm., and the white blood cell count 11,200. The blood sugar was 75 mg. per hundred cubic centimeters and the Wassermann reaction was negative.

CASE 4.—D. K., a white man aged 40, in February 1937 complained of frequent bulky stools, a loss of 50 pounds (22.7 Kg.) and severe weakness. About three years previously the patient had had an acute attack of pain in the upper part of the abdomen associated with chills, fever, nausea, vomiting and jaundice. This initial attack was followed by a series of similar episodes, some of which were accompanied by ascites and edema. When we saw the patient he had been free of acute symptoms for about six months, but the abnormal stools and loss of weight and strength had continued unabated.

Aside from evidence of a striking loss of weight, physical examination and urinalysis revealed no abnormalities. The red blood cell count was 4,120,000, the hemoglobin content 11.2 Gm. and the white blood cell count 8,700. The Wassermann reaction was negative.

In all 4 of these cases a clinical diagnosis of chronic pancreatitis appears to be justified. In 2 cases (3 and 4) the chronic changes apparently resulted from a preceding acute pancreatitis associated with pancreatic calculi. In case 2 calcification in the absence of acute symptoms suggests a degenerative process rather than obstruction of the duct by calculi. Case 1 probably represents a primary chronic pancreatitis, possibly on a syphilitic basis. It is interesting that the extensive damage to the acinar portion of the pancreas present in all 4 of these cases was associated with concomitant islet damage of sufficient severity to produce diabetes in only 2.

The history and signs presented by these 4 cases warranted a clinical diagnosis of pancreatic achylia. However, in each case an unequivocal diagnosis was established by demonstrating (1) an absence of pancreatic enzymes in the duodenal drainage, (2) an increase in the quantity of both nitrogen and fat in the feces and (3) a reduction in the wastage of both nitrogen and fat with substitution therapy.

We believe that these laboratory determinations are essential for the absolute diagnosis of uncomplicated pancreatic achylia.

#### LABORATORY PROCEDURES

1. *The Determination of Enzymes in Duodenal Drainage.*—Methods: After testing all the more promising of the enzyme methods we have adopted the following as the most satisfactory of the available tests: amylase (Willstätter's method<sup>11</sup>), lipase (Cherry and Crandall's method<sup>12</sup>) and trypsin (Northrop's non-protein nitrogen method<sup>13</sup>). In routine examination of the duodenal fluid, 1 part of a satisfactory (clear and definitely alkaline to litmus) specimen is diluted with 24 parts of  $p_H$  7.0 buffer; 1 cc. of this mixture is used for the determination. When an enzyme deficiency is suspected, the duodenal fluid is diluted with only 4 parts of buffer solution. Because amylase is destroyed rather rapidly, the enzyme assay should be carried out immediately. If this is not practical, the duodenal fluid should be iced during storage. In no case should the analysis be delayed for more than a few hours.

Results: In all 4 patients there was a total absence of enzyme activity in the duodenal fluid. It should be emphasized that these are the only patients we have encountered for whom this has been true. (The methods are so designed that they would fail to detect the relatively feeble enzymes present in most body fluids and which might be expected to be present in the duodenal fluid in the absence of pancreatic secretion.)

2. *The Determination of Protein and Fat Loss in the Stool.*—Methods: The studies on intestinal absorption and the effect of enzyme therapy have all been conducted in the following manner: The patient is placed on a standard balanced diet supplying 64 Gm. of protein (10.3 Gm. of nitrogen) and 112 Gm. of fat daily for a period of six days. Carmine 5 grains (0.33 Gm.) is given with the first meal on the standard diet, again with breakfast on the fourth day and finally with the first meal after the standard diet has been discontinued. Starting with breakfast on the fourth day, the patient is given with each meal 8 Gm. of potent pancreatin in the form of enteric coated tablets. At the time of the appearance of the first dose of carmine in the stool, collection of the total fecal output is initiated and continued until the last dose of carmine makes its appearance. The carmine given on the fourth day serves to separate the control period from the enzyme period. Immediately after passage the feces are transferred to an air tight bottle containing 5 cc. of toluene and stored in a refrigerator. Each day the total fecal output for the preceding twenty-four hours is weighed, thoroughly mixed and sampled for chemical determinations. The samples for each period (control and enzyme) are pooled and the determinations are carried out on the composite samples. The samples for the nitrogen determination are suspended in sulfuric acid as recommended by Peters and Van Slyke;<sup>14</sup> samples for the determination of fat are preserved in alcohol, which is then used for the initial lipid extraction. Nitrogen is determined by the Kjeldahl method and fat by a modification of Saxon's method.<sup>14</sup> All determinations are conducted in dupli-

11. Schmidt, C. R.; Greengard, Harry, and Ivy, A. C.: A Comparison of Methods for the Quantitative Estimation of Diastase in Duodenal Fluid, *Am. J. Digest. Dis. & Nutrition* 1: 618 (Nov.) 1934.

12. Cherry, I. S., and Crandall, L. A.: The Specificity of Pancreatic Lipase: Its Appearance in the Blood After Pancreatic Injury, *Am. J. Physiol.* 100: 266 (April) 1932.

13. Northrop, J. H., and Kunitz, M.: Crystalline Trypsin: Experimental Procedure and Methods of Measuring Activity, *J. Gen. Physiol.* 16: 313 (Nov.) 1932.

14. Peters, J. P., and Van Slyke, D. D.: *Quantitative Clinical Chemistry*, Baltimore, Williams & Wilkins Company, 1932, vol. 2.

cate. No information of definite diagnostic value is obtained by determining the ratio of undigested fat (neutral fat) to digested fat (soaps and fatty acids). It has been shown that even in the absence of pancreatic digestion the ratio may be normal.<sup>15</sup>

Results: The results of the absorption studies on the four patients are summarized in table 2. Using the same experimental procedure on normal human subjects on somewhat more liberal diets, we have found the average daily fecal nitrogen to range between 1.5 and 2.3 Gm. and the average daily fecal lipids between 7 and 10 Gm. As is well known, the fecal nitrogen and fat of the normal subject are largely of metabolic origin.<sup>16</sup>

Most of the conclusions to be drawn from an examination of table 2 are self evident. Substitution therapy effected an average reduction in fecal nitrogen

nitrogen balance was actually negative to such an extent, it is probable that the absorption period was too short (three days) to average out fully the error due to daily variation; i. e., since the quantity of fat or nitrogen excreted in the feces is sometimes subject to relatively wide daily variation, the control test in this patient may have been obtained during a period when nitrogen excretion was greater than average. (Where it is practical, this source of error can be largely eliminated by extending the absorption period to five or more days.) This consideration in no way invalidates the results obtained on this patient. The difference between control and enzyme periods is far greater than could be attributed to daily variation.

3. *Treatment: Results of the Oral Administration of Pancreatin.*—The pancreatin used throughout this study possessed the following activity: trypsin from 50 to 100

TABLE 1.—The Effect of Achylia Pancreatica on Food Utilization and the Value of Substitution Therapy in Man

Diagnosis	Percentage of Ingested Fat and Nitrogen Excreted in Feces				Type and Quantity of Enzyme Preparation	References
	Control Period		Enzyme Period			
	Fat	Nitrogen	Fat	Nitrogen		
	63	..	36	..	Raw pancreas	Masuyama and Schild, cited by Tileston
	52	70	20	22	Raw pancreas	Salomon, H.: Berl. klin. Wchnschr. 39:
	53	87	17	25	Pancreatin	45, 1902
	72	40	58	27	Pankreon 3 Gm.	Ury, H., and Alexander, M., cited by Tileston
	74	64	35	38	Pankreon 25 Gm.	Meyer, E.: Ztschr. f. exper. Path. u. Therap. 3: 58, 1906
Chronic pancreatitis	50	43	17	17	Pancreatin 3 grains t. i. d.	Ehrmann, R.: Ztschr. f. klin. med. 69: 319, 1910
Chronic pancreatitis	73	62	28	20	Pancreon	Tileston, Wilder: Tr. A. Am. Physicians 26: 513, 1911
Average.....	62	61	30	25		

TABLE 2.—Results of Absorption Studies

Patient	Daily Diet		Feces (Average Daily Results)									
			Control Period				Enzyme Period					
	Fat	Nitrogen*	Wet Weight, Gm.	Nitrogen, Gm.	Percentage Ingested Nitrogen in Feces	Fat, Gm.	Percentage Ingested Fat in Feces	Wet Weight, Gm.	Nitrogen, Gm.†	Percentage Ingested Nitrogen in Feces	Fat, Gm.	Percentage Ingested Fat in Feces
D. K.	112	10.3	332	6.00	53	....	..	230	3.7	27.9	....	....
W. E.	112	10.3	361	7.92	77	44.5	40	218	3.6	27.1	28	25.0
W. M.	112	10.3	706	13.30	100‡	94.0	84	309	3.1	22.6	21.1	15.8
B. D.	112	10.3	366	4.15	40	84.7	76	155	1.57	11.8	32.7	29.2
Average	112	10.3	441	7.84	76	74.4	66	216	2.99	22.5	27.3	24.4

\* The pancreatin administered during the enzyme period contained 2.98 Gm.  
† During this period 13.28 Gm. of nitrogen was ingested.

of 62 per cent and in fecal lipids of 63.3 per cent. When one thinks of this effect in terms of conserved calories the results are extremely striking. Therapy resulted in an average reduction in fecal nitrogen of 4.85 Gm. In terms of protein, this represents 30.1 Gm. (4.85 × 6.2), or 123 calories (30.1 × 4.1). Therapy resulted in an average reduction in fecal fat of 47.1 Gm., or 424 calories (47.1 × 9). Thus, an average of 547 calories a day, which would otherwise have been wasted, was made available when therapy was instituted. The saving in vitamins (particularly the fat soluble vitamins), minerals and essential amino acids can only be surmised.

It will be noted in the case of patient W. M. that during the control period the average quantity of nitrogen eliminated in the feces was greater than the quantity ingested. Since it appears unlikely that the

per cent above U. S. P. specifications, lipase 2,200 Cherry-Crandall units per gram, and amylase 7.2 Willstatter units per gram. It compares favorably in potency with the best products that we were able to obtain. Of eight products bought at local drug stores and tested, two were essentially inactive and two possessed little more than half the activity of the preparation used.

Immediately after completion of the various tests the patients were placed on a high caloric, high protein, low fat, low residue diet and 8 Gm. of pancreatin, in the form of enteric coated tablets, with each meal, or a total daily dose of 24 Gm. Half of the pancreatin was taken immediately before and half immediately after the meal. Compared to the conventional dose of pancreatin, this quantity is of course tremendous. In terms of replacement therapy, however, it is not so impressive. The pancreatin that we have employed is approximately ten times as potent, weight for weight, as average pancreatic juice. The total daily dose of 24 Gm. corresponds,

15. Bodansky, Meyer, and Bodansky, Oscar: Biochemistry of Disease, New York, Macmillan Company, 1940, p. 207.  
16. Lusk, Graham: The Elements of the Science of Nutrition, ed. 4, Philadelphia, W. B. Saunders Company, 1928, p. 49.

therefore, to approximately 240 cc. of pancreatic juice. This represents only about 15 per cent of the quantity normally estimated to be secreted in twenty-four hours. The initial dose of pancreatin was maintained for one month. Thereafter the daily dose was progressively reduced until, as evidenced by subjective reactions and the character of the stool, a satisfactory maintenance dose was obtained. This has varied among the patients between 2 and 3.3 Gm. with each meal. It is worthy of note that none of the patients have manifested any inclination to revolt against the large dose.

Because it was not specifically indicated, no other form of treatment was instituted. In general, at least temporary supplementation of the diet with vitamins and minerals would appear to be indicated. Indications for other therapeutic measures would, of course, vary with the individual case.

Response to treatment occurred early. As can be judged from table 2, the bulk of the stools was reduced within twenty-four hours. Within the same period of time there was a reduction in the frequency of stools. Gains in weight, reflected by increased strength, were noted within a few days. Patients B. D., M. M. and W. E. are still under observation after periods of six months, a year and a half and three years respectively. D. K. met an accidental death after two and a half

celiac disease, exclusion of bile from the intestine and other conditions characterized by bulky stools. The presence in the stool of many meat fibers along with large amounts of fats and soaps is presumptive evidence that there is significant impairment in the digestion and absorption of protein as well as of fat. In certain cases, however, we have found that chemical analysis for nitrogen failed to confirm the impression derived from microscopic examination of the stool. The bulk of the stool nitrogen is in a form having no morphologic characteristics, i. e. protein in all stages of degradation. In certain cases of "simple" diarrhea (enteritis, colitis) we have found large quantities of meat fiber when the total nitrogen was only slightly greater than normal. Thus it appears that, as an index of total nitrogen, the presence of meat fibers in the stool may be misleading.

As was noted previously, unequivocal diagnosis of pancreatic achylia is possible only when it can be shown that there is an absence of pancreatic ferments in the duodenal drainage, an excess of both fat and nitrogen in the stool and a response to substitution therapy. Theoretical considerations as well as experience have led us to emphasize the importance of the latter determination. We have never seen pancreatic achylia either clinically or in an experimental animal which failed to respond to adequate enzyme therapy. Conversely, in the absence of demonstrable pancreatic insufficiency, we have never seen enzyme therapy effect a reduction in the nitrogen or fat of the stool.

In all cases starch granules, as revealed by microscopic examination, were less abundant in the stools than would be anticipated on the basis of the insufficiency of digestion of protein and fat. This is probably due to two factors: First, salivary and intestinal amylase are both relatively potent hydrolytic agents, so that even in the absence of pancreatic juice significant starch hydrolysis can occur. Second, starch reaching the colon is rather rapidly destroyed by bacteria. The latter fact probably accounts for the distressing colonic flatulence complained of by two of the patients prior to the institution of pancreatin therapy.

It is to be noted that all of the patients discussed in this communication were adults. However, Andersen<sup>18</sup> has shown that, in children, the achylia pancreatica due to cystic fibrosis of the pancreas will respond to adequate pancreatin therapy.

#### SUMMARY

A review of the literature reveals that it has been conclusively shown that exclusion of pancreatic juice from the intestine in experimental animals results in a decided impairment in the digestion and absorption of protein, fat and carbohydrate. Studies on the effect of enzyme therapy in experimental animals with achylia pancreatica have been less consistent, but there is abundant evidence that adequate therapy increases the utilization of all three of the major foodstuffs (protein, carbohydrate and fat). The few properly conducted clinical studies on patients with achylia pancreatica have uniformly shown that enzyme therapy effects a significant increase in the utilization of protein and fat.

In each of the four cases of achylia pancreatica studied the diagnosis was established by demonstrating (a) an absence of pancreatic ferments in the duodenal drainage, (b) an excess of both fat and nitrogen in the stool and (c) increased absorption of both fat and nitrogen when substitution (enzyme) therapy was instituted. Enzyme therapy decreased the quantity of fat excreted

TABLE 3.—Summary of Changes in Weight of Four Patients

Patient	Original Weight	Weight When First Seen by Authors	Period of Treatment, Months	Final Weight
W. M. ....	120	98	18	133
D. K. ....	190	140	2.5	155
W. E. ....	175	142	36	148
B. D. ....	190	150	6	174

In the case of patient W. E., 148 pounds represents a satisfactory weight, so an effort has been made to stabilize it at that level.

months of observation. Table 3 is a summary of changes in weight that have occurred in the various patients.

Prior to the institution of treatment weakness had forced W. M. and D. K. to abandon most of their normal pursuits, and because of asthenia their gait was titubant. Asthenia had also significantly restricted the activities of B. D. and W. E. Within a period of a few weeks after starting treatment all the patients were able to resume their normal activities.

#### COMMENT

Coope<sup>17</sup> is of the opinion that in most cases pancreatic insufficiency can be diagnosed by relatively simple tests, the most important being visual examination of the stool. Certainly in many cases the relatively elaborate tests herein described are not vital to a diagnosis. Correlation of signs and symptoms with the impression gained from visual examination of a twenty-four hour specimen of stool may suffice for clinical diagnosis. If the original diagnosis is confirmed by the results of a therapeutic test (pancreatin therapy) it can be accepted with reasonable assurance. Certain cases defy exact diagnosis, however, unless full advantage is taken of the laboratory. It is only in pancreatic achylia that failure of fat utilization is paralleled by a concomitant failure in protein utilization. However, chemical analysis of the stool may be necessary to demonstrate this characteristic which distinguishes pancreatic achylia from sprue, idiopathic steatorrhea (nontropical sprue),

17. Coope, Robert: *The Diagnosis of Pancreatic Disease*, New York, Oxford University Press, 1927.

18. Andersen, D. H.: Cystic Fibrosis of the Pancreas, Vitamin A Deficiency, and Bronchiectasis, *J. Pediat.* 15: 763 (Dec.) 1939.



in the stool by an average of 63.3 per cent and the quantity of nitrogen by an average of 62 per cent. In all cases a clinical response to therapy was manifested within a few days. The response was characterized by a decrease in the frequency and bulk of the stools, associated with gains in weight and increased strength. Two of the patients who had been reduced to a state of semi-invalidism by loss of weight and inanition were able to resume their normal activities within a few weeks after treatment was instituted. The response of the other two patients was equally satisfactory but less dramatic, because the initial symptoms were less severe.

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## TOTAL THYROIDECTOMY IN THE TREATMENT OF DIABETES INSIPIDUS

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Considerable advance has been made in recent years in the physiology of the thyroid gland in relation to the other organs of internal and of external secretion. However, during the past forty-five years, clinicians have reported improved elimination of water in certain forms of nephritis by the administration of desiccated thyroid and more recently of thyroxine, alone or combined with solution of parathyroid.<sup>1</sup> No explanation for the effects noted has been forthcoming beyond the possibility that these drugs increase the mobilization and excretion of calcium. Early work has shown that there is a definite relation between the thyroid and the pituitary gland. As early as 1889 Rogowitsch<sup>2</sup> found alterations in the pituitary glands of thyroidectomized dogs and rabbits in the nature of an increase in certain elements in the glandular or anterior portion. Shortly afterward, Hofmeister,<sup>3</sup> Gley,<sup>4</sup> Pisenti and Viola,<sup>5</sup> Schönemann<sup>6</sup> and others reported changes in the pituitary body following removal or disease of the thyroid. Later, Herring<sup>7</sup> observed after thyroidectomy an increased activity of cells in the pars intermedia and most striking changes in the nervous part of the posterior lobe and in the laminae forming the floor of the third ventricle. Strauss<sup>8</sup> reported a patient aged 9 years, in whom diabetes insipidus developed which progressively disappeared at the age of 13 with the gradual onset of myxedema. Coronedi<sup>9</sup> found a diminished volume of urine after thyroparathyroidectomy in dogs which in general was not much influenced by the ordinary diuretics, although thyroid produced severe diuresis. He considered the kidneys

to have a specific physiologic action pertaining to the internal secretion of the thyroparathyroid gland.

Recent studies on the pituitary gland also have suggested that the thyroid gland is involved in the excretion of water through the kidneys. Barnes, Regan and Bueno<sup>10</sup> noted polyuria in dogs after the injection of solutions of the anterior lobe of the pituitary gland, and when thyroidectomy was done polyuria did not occur. Biasotti<sup>11</sup> confirmed these observations and also noted that the diuretic activity of the thyroid was shown anew in tests on dogs which received large doses of desiccated thyroid. Marine and Rosen<sup>12</sup> studied several instances of polyuria in rabbits which developed in connection with experiments on goiter produced by cyanide and alfalfa hay. The polyuria began within two days after the administration of small doses of potassium iodide was begun, and goitrous rabbits thus treated showed intense hyperthyroidism. In 1 instance the polyuria persisted for three months, at which time a thyroidectomy was performed and the polyuria gradually receded. However, when desiccated thyroid was administered, the polyuria recurred on the second day of treatment. Mahoney and Sheehan<sup>13</sup> produced polyuria and polydipsia in dogs by occlusion of the pituitary stalk with a silver clip and noted that this effect was abolished by subsequent total thyroidectomy and reestablished by the oral administration of desiccated whole thyroid gland. Fisher and Ingram<sup>14</sup> produced experimental diabetes insipidus in cats by interruption of the supra-opticohypophyseal tracts on both sides and found that the removal of the thyroid gland resulted in a diminution of the water exchange and that the subsequent feeding of thyroid brought on a severe diuresis which persisted for some time after the effect of the thyroid had worn off.

From a review of the literature, it appears that there is a relation between the thyroid and pituitary glands and that the thyroid gland is a factor in maintaining water balance and possibly plays a role in the regulation of the intake and output of fluid in patients with diabetes insipidus. It appeared of value to apply this knowledge clinically in the treatment of diabetes insipidus. Consequently, total thyroidectomy was performed in 1935 on 3 patients with diabetes insipidus. This paper reports the results obtained on these patients after a five year interval.

### PLAN OF INVESTIGATION

The general plan of study included various observations made in each case before and after total thyroidectomy. The fluid intake and urinary output were measured daily for many months and periodically after the operations. The specific gravity of the urine was measured at intervals during the day. The basal metabolic rate was determined on thirty-eight, forty and sixty-four occasions in the respective cases. The plasma or serum was analyzed on many occasions for sugar, cholesterol, nonprotein nitrogen, protein, albumin, globulin, chlorides, calcium and phosphorus. The hemoglobin, red blood cell counts and hematocrits were determined. The result of the serum calcium determination taken before thyroidectomy in the first case

From the Medical and Surgical Clinics of the Peter Bent Brigham Hospital.

1. Marine, David: The Physiology and Principal Interrelations of the Thyroid. *J. A. M. A.* 104: 2250 (June 22) 1935.

2. Rogowitsch, N.: Die Veränderungen der Hypophyse nach Entfernung der Schilddrüse. *Beitr. z. path. Anat. u. z. allg. Path.* 4: 453, 1889.

3. Hofmeister, Franz: Zur Physiologie der Schilddrüse. *Fortsehr. d. Med.* 10: 81, 1892.

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5. Pisenti, G., and Viola, G.: Beitrag zur normalen und pathologischen Histologie der Hypophyse und bezüglich der Verhältnisse zwischen Hirnanhang und Schilddrüse. *Centralbl. f. die m. Wissensch.* 28: 450, 1890.

6. Schönemann, A.: Hypophysis und Thyroidea. *Virehows Arch. f. path. Anat.* 129: 310, 1892.

7. Herring, P. T.: The Effects of Thyroidectomy on the Mammalian Pituitary. *Quart. J. Exper. Physiol.* 1: 281, 1908.

8. Strauss, L.: Uebergang eines Falles von Diabetes insipidus in Myxödem. *Deutsche med. Wochenschr.* 46: 939 (Aug. 19) 1920.

9. Coronedi, G.: Recherches comparatives sur l'action des diurétiques et de l'extrait thyroïdien sur le rein du chien thyroïdectomisé. *Arch. ital. de biol.* 52: 336, 1909.

10. Barnes, B. O.; Regan, J. F., and Bueno, J. G.: Is There a Specific Diuretic Hormone in the Anterior Pituitary? *Am. J. Physiol.* 105: 559 (Sept.) 1933.

11. Biasotti, A.: Tiroides y acción diurética del extracto de lóbulo anterior de la hipófisis. *Rev. Soc. argent. de biol.* 9: 499 (Nov.) 1933.

12. Marine, David, and Rosen, S. H., cited by Marine.

13. Mahoney, William, and Sheehan, Donald: The Effects of Total Thyroidectomy on Experimental Diabetes Insipidus in Dogs. *Am. J. Physiol.* 112: 250 (June) 1935.

14. Fisher, Charles, and Ingram, W. R.: Effect of Feeding of Thyroid or Salt and of Thyroidectomy on Fluid Exchange of Cats with Diabetes Insipidus. *Arch. Int. Med.* 58: 117 (July) 1936.

was known the day after operation. To our surprise, the calcium content was found to be 14 mg. per hundred cubic centimeters of serum. With such a high calcium level it seemed that there might be a disturbance in the parathyroid glands in this disease because polyuria is

TABLE 1.—Laboratory Data in Case of Diabetes Insipidus, Before and After Thyroidectomy (Case 1)

	Before Operation	After Operation			
		7 Mos.	21 Mos.	53 mos.	
Basal metabolic rate.....	+20	-12	+14		+10
Serum *					
Calcium.....	14.0	11.2	10.6	...	
Phosphorus.....	3.8	3.8	3.8	...	
Protein.....	6.5	6.0	7.6	...	
Albumin.....	4.0	3.4	4.1	...	
Globulin.....	2.5	2.6	3.5	...	
Sodium chloride.....	640	690	650	593	
Cholesterol.....	253	328	260	286	
Sugar.....	101	108	95	...	
Nonprotein nitrogen.....	30	29	23	...	
Hematocrit					
Corpuscles.....	40%	36%	37%	...	
Plasma.....	60%	64%	63%	...	
Weight in pounds.....	211	219	209	194	
Erythrocytes.....	4.32	4.17	...	4.20	
Hemoglobin, percentage.....	81	75	...	85	

\* In all the tables, the serum data are recorded in milligrams per hundred cubic centimeters except the protein, albumin and globulin, which are expressed in grams per hundred cubic centimeters. The figures for erythrocytes represent millions.

also a symptom in some cases of hyperparathyroidism. For this reason, one parathyroid gland was removed for investigation from the subsequent 2 patients. The thyroid and parathyroid glands were studied grossly and microscopically. The weight and the general condition of each patient were noted frequently.

#### CLINICAL MATERIAL AND REPORT OF CASES

The persons who were studied consisted of 1 woman aged 66 and 2 men aged 27 and 29. All had had diabetes insipidus for a number of years, and the degree of the polyuria and the polydipsia were well established over a long period of time. They were controlled with adequate amounts of solution of posterior pituitary

TABLE 2.—Basal Metabolic Readings in Case 1 Before and After Thyroidectomy on June 24, 1935 (No Thyroid Was Given)

Date, 1935	Basal Metabolic Rate	Date, 1936	Basal Metabolic Rate	Date, 1937	Basal Metabolic Rate
6/19	+20	1/14	-12	10/26	+11
6/20	+21	2/11	-17	11/23	+3
7/2	+8	3/10	-18		
7/13	+11	4/29	+4	1938	
8/6	-2	5/4	-11	11/8	+8
8/8	+11	5/5	-1	1939	
8/19	-7	9/16	-5	3/28	+26
9/10	-12	9/26	-5	6/13	+16
9/16	-19	11/17	-10	6/20	+6
9/23	+2	12/21	-9	11/14	+3
				11/17	+10
1935		1937			
10/15	+12	3/2	+6	1940	
11/26	+26	3/9	+14	4/23	+4
12/17	-11	6/8	-3	4/30	+10
12/31	-11	10/18	+19		

given intranasally or intramuscularly. All had gastric distress at times, which Blotner<sup>15</sup> found frequently in cases of diabetes insipidus. The spinal fluids were not remarkable except for slight increases in the calcium concentration.<sup>16</sup> The etiology was idiopathic in the woman's case and of postencephalitic origin in the

men's cases. The Wassermann and Hinton reactions were negative in each case. The men were confined to institutions for chronic conditions because of their neurologic disturbances and because of their helplessness. All were anxious to have the operation, with the hope that they might be relieved of the diabetes insipidus, and they were extremely cooperative in this investigation. The total thyroidectomies were performed by Cutler. Because of the results, the individual cases are presented:

CASE 1.—Mrs. M. A., a housewife aged 66, was studied in the wards of the hospital for the first time from June 18 to July 16, 1935, although previously she had been observed in the medical laboratory at regular intervals for a period of three years. Her chief complaint was severe thirst and great frequency of urination.

The present illness had begun six years previously, at which time she suddenly noted an insatiable thirst accompanied by abnormal frequency of urination during the day and night. She had been drinking and passing as much as and at times more than 12 to 14 liters. Solution of posterior pituitary administered intramuscularly or intranasally gave relief of the polydipsia and polyuria. The family and past histories were negative. She had been married forty-seven years and had had

TABLE 3.—Laboratory Data in L. C., Case of Diabetes Insipidus and Postencephalitic Parkinson's Disease, Before and After Total Thyroidectomy (Case 2)

	Before Operation	After Operation		
		9 mos.	30 mos.	56 mos.
Basal metabolic rate.....	+24 to +36	-22	-15	-4
Serum				
Calcium.....	10.2	9.8	7.6	...
Phosphorus.....	3.7	2.8	3.0	...
Protein.....	7.0	8.0	6.9	...
Albumin.....	3.7	4.0	4.3	...
Globulin.....	3.3	4.0	2.6	...
Sodium chloride.....	589	566	555	...
Cholesterol.....	157	250	263	...
Sugar.....	90	92	116	...
Nonprotein nitrogen.....	20	24	33	...
Hematocrit				
Corpuscles.....	42%	40%	...	...
Plasma.....	58%	60%	...	...
Weight in pounds.....	120	158	109	172
Erythrocytes.....	4.70	5.04	5.02	...
Hemoglobin, percentage.....	85	95	90	...

eleven children. She went through the menopause uneventfully at the age of 41. The physical examination was negative except for great obesity. Her height was 5 feet (152 cm.) and her weight 209 pounds (95 Kg.). The skin was dry. The blood pressure stayed at about the level of 146 systolic and 72 diastolic. The diabetes insipidus appeared to be idiopathic because no signs of a tumor of the brain could be detected by physical examination, roentgenograms or lumbar puncture.

Many laboratory tests were made before operation; a summary of the results is given in table 1. The laboratory data were not remarkable except for an increase in the serum calcium and cholesterol and basal metabolism readings of +20 and +21 per cent on June 19 and 20. Electrocardiograms showed a preponderance of the left ventricle with a pulse rate of 72.

Thyroidectomy was performed on June 24. For the four days before the operation the intake of fluid ranged from 10,400 to 12,350 cc. and the volume of urine from 9,700 to 10,400 cc. Subsequently the intake and output of fluid have remained at the same level as before the operation. However, solution of posterior pituitary has been possibly a little more effective in controlling the diabetes insipidus than before.

The thyroid gland weighed 16.5 Gm. and contained a small calcified adenoma in the inferior pole. Microscopic examination showed considerable foci of fibrosis. The persisting thyroid follicles varied moderately in size and were mostly low cuboidal, in some places flat. There was considerable variation in staining of the colloid and there was some peripheral scalloping. Capillaries and smaller vessels were slightly congested. The stroma was slightly less discernible than in the normal gland. There appeared to be some hyperactivity of the thyroid gland.

15. Blotner, Harry: Gastric Analyses and Gastric Symptoms in Diabetes Insipidus, *Am. J. Digest. Dis.* 7: 73 (Feb.) 1940.

16. Blotner, Harry: The Calcium and Phosphorus in the Cerebrospinal Fluid in Diabetes Insipidus, *Am. J. M. Sc.*, to be published.

The patient has been readmitted to the hospital on six occasions for study for periods which ranged from two to four weeks. The various laboratory data since operation are also given in table 1. These data have not changed remarkably except that the blood calcium level has come down to normal. The cholesterol has remained at an elevated level, which Blotner<sup>17</sup> has shown to occur frequently in diabetes insipidus. The basal metabolic rate was interesting in that it showed a temporary drop after thyroidectomy to  $-19$  per cent without any change in the water balance. However, the metabolism has increased so that now it is about the same as before thyroidectomy without the administration of thyroid, as shown in table 2. Just what is the cause for this rise in metabolism is uncertain. However, it seems likely that there is some aberrant thyroid tissue present to account for this and for the unchanged water metabolism. The thyroid gland was examined carefully after operation and was found to be entirely removed with its capsule. However, the patient did not show any symptoms or signs of hypothyroidism after the operation, and her physical status has remained about the same.

Electrocardiograms taken Dec. 12, 1936 and April 23, 1940 have continued to show a preponderance of the left ventricle with a normal fourth lead. Seven foot roentgenograms of the heart showed no essential change in the measurements of the heart in nine months and again in five years after thyroidectomy, there being some cardiac enlargement which was present before the operation.

CASE 2.—L. C., a man aged 27, single, entered the hospital for the first time Aug. 28, 1935 and was discharged October 25. He too, had been observed previously for several years. He had post-encephalitic paralysis agitans and diabetes insipidus. His illness had begun ten years before when he had what appeared to be influenza and sleeping sickness. One year later he noted a staggering gait which became progressively worse. A year after that he began to have difficulty with his eyes, which would roll and become fixed in an upward or downward position for hours; these rollings are the typical oculogyric crises of paralysis agitans. Subsequently there appeared typical and progressive symptoms of paralysis agitans, and the patient began to drink and pass large quantities of water during the day and night. At times he voided from 12 to 14 liters a day, but the average was usually 8 to 10 liters. The polyuria and polydipsia were relieved by solution of posterior pituitary, but this gave him severe headaches. For the past seven years he had been taking daily five or six pills of stramonium, each containing  $2\frac{1}{2}$  grains (0.16 Gm.). The difficulty in walking became progressively worse, and the ocular attacks were more frequent and of longer duration, often lasting for a whole day or even longer. The family and past histories were essentially negative. The patient's weight had been 145 pounds (66 Kg.) about four years previously, and the present weight was about 124 pounds (56 Kg.).

Physical examination revealed him to have typical paralysis agitans. His height was  $67\frac{1}{2}$  inches (171 cm.) and his weight 120 pounds (54 Kg.). The blood pressure was 148 systolic and 98 diastolic. The patient had a staring facies. The mouth was kept open and the tongue protruded most of the time. The eyeballs moved spastically. The teeth were extensively carious. The patient had a definite parkinsonian gait with noticeable shuffling of the feet on locomotion and dragging of the left leg. There was a severe tremor of the hands with voluntary movement. A roentgenogram of the skull was negative.

The various laboratory data are given in table 3; the results are not remarkable except that the blood cholesterol content was decreased and the basal metabolism increased to  $+24$  and to  $+36$  per cent before operation. Stramonium was given before all, except the first, metabolism tests to control the tremors.

On September 25 a total thyroidectomy was performed and one parathyroid gland was removed. The thyroid gland weighed 16.5 Gm. and was essentially normal, as was the parathyroid gland. The thyroid showed moderately large follicles with an appreciable amount of normally staining colloid. Epithelium lining follicles ranged from low cuboidal to flat. Vascularity was not extensive. The parathyroid gland microscopically showed the cords of alpha and beta cells arranged about small capillaries. The cells were uniform in size and were present in normal proportions. Occasionally small groups of acidophil cells were present.

For five days before the operation the intake of fluid ranged from 7,900 to 10,050 cc. and the urinary volume from 6,800 to 7,600 cc. Subsequently, the intake and output of fluid gradually decreased, so that within a month after the operation they were 3,400 cc. and 3,200 cc. respectively, as shown in chart 1. The specific gravity of the urine, which usually ranged from 1.000 to 1.002 before operation, increased to from usually 1.003 to 1.016 after operation. The various laboratory data after opera-

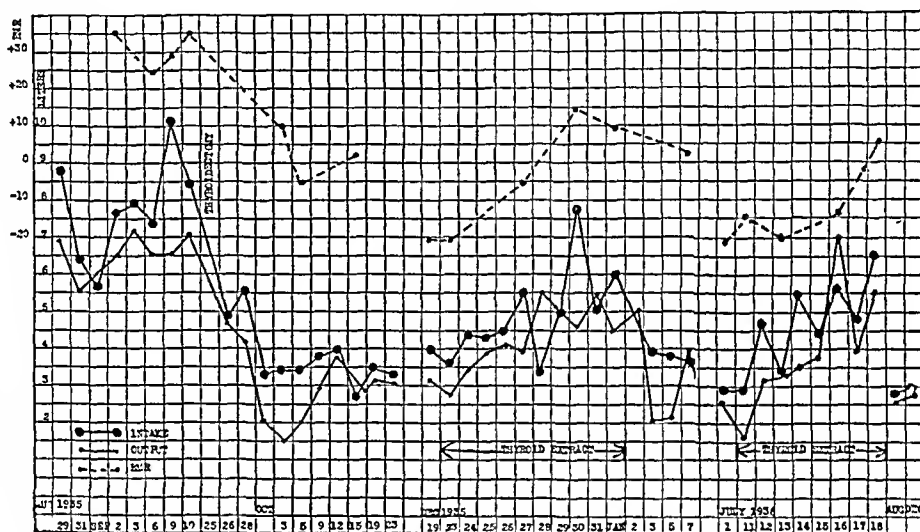


Chart 1 (case 2).—Effect of total thyroidectomy and of the subsequent intake of thyroid during two periods on the intake and output of fluid. One-tenth Gm. of thyroid was taken daily during the first period and 0.26 Gm. daily during the second.

tion, as given in table 3, showed a significant decrease in the basal metabolism, increase in the blood cholesterol and an appreciable increase in the patient's weight. Otherwise, there were no remarkable changes.

The daily intake and output of fluid continued to remain at a fairly constant volume of about 200 cc. to 300 cc. above or below the 3,000 cc. level, even though the patient had taken 0.015 Gm. of thyroid three times a week. On this regimen his basal metabolism remained at a level of approximately  $-20$  per cent. However, in the past year he has been taking 0.06 Gm. of thyroid daily and his intake and output of fluid have been at slightly higher levels, about 3,700 to 3,800 cc., and the metabolic rate recently ranged from  $+22$  to  $-4$  per cent.

In general, the patient has felt and looked better and has had no nocturia. Thyroidectomy has had some beneficial effect on the Parkinson's disease, although he has continued to take the same dose of stramonium. The tremors have decreased so that he can take fluids without spilling them. He is able to walk a little better, and his mouth does not stay open as much as before the operation. The oculogyric crises have diminished considerably in duration and in number, although since he has been taking 0.06 Gm. of thyroid daily they have increased in number. His mentality is the same as it was before the operation. The patient says he is glad that he had the operation.

17. Blotner, Harry: Blood Fat Tolerance Tests in Malnutrition and Obesity, Arch. Int. Med. 55: 121 (Jan.) 1935.

This patient was readmitted to the hospital on three occasions after thyroidectomy for periods ranging from two to seven weeks for study of the effect of thyroid and of dinitrophenol on water balance. The details of these observations will be discussed with those of the next case. However, in brief, when thyroid was administered the polyuria and polydipsia returned but were not as excessive as before the operation.

CASE 3.—L. R., a man aged 29, single, entered the hospital for the first time on March 7, 1934 with complaints of polydipsia, polyuria and tremor of the left arm and leg for nine years. His illness began in 1924, when he began to be abnormally thirsty and passed an excessive amount of urine. At that time he was in the army and was discharged because of "weak kidneys." In 1926 he had fever and malaise and slept for three days. Subsequently, he was abnormally drowsy for six months. With the beginning of the drowsiness he began to notice trembling of his left arm and leg when at rest, and this became more severe, so that he had to shuffle his left leg when walking. For a year he had frequent supraorbital headaches. For years he had been taking  $\frac{1}{100}$  grain (0.0006 Gm.) of scopolamine

Before thyroidectomy the daily intake of fluid usually ranged from 8,400 to 10,775 cc., although on rare occasions it was as low as 6,000 cc. The volume of urine usually varied from 6,525 cc. to 8,525 cc.

On October 30 a total thyroidectomy was performed and one parathyroid gland was removed. The postoperative course was gratifying, and the intake and output of fluid dropped rapidly, so that by November 19 these values were 3,660 cc. and 3,710 cc. respectively, with slightly higher and lower variations before this date, as shown in chart 2. The basal metabolic rate dropped to -23 per cent on November 19. The patient was more than pleased with his condition, and he volunteered the information that for the first time in years he was able to get a good night's sleep because the nocturia had disappeared. His tremors practically disappeared, and he looked better generally, but he continued to take about the same amount of scopolamine hydrobromide. He says that his mind has improved since the operation because he can concentrate and read better now.

The thyroid gland weighed 20 Gm. and showed some evidence of hyperactivity. On section, it showed a slight increase in fibrous tissue as represented by scattered trabeculae, deep gray in color, but the intervening thyroid parenchyma was a pale tan with a deep red cast. Colloid was within normal limits. On microscopic examination, the thyroid showed most follicles of normal size with the usual amount of colloid. A few small follicles were present. Follicles occasionally showed high cuboidal epithelium, although most of the epithelium was low cuboidal, occasionally flat. Some of the follicles lined with high cuboidal epithelium contained little colloid. Rare follicles showed slight papillary projections. The stroma was scant. There was slightly more than the usual degree of vascularity.

The parathyroid gland appeared normal. Microscopically its closely packed cells were arranged in cords with little intervening fat or connective tissue. Most of the cells were of the clear type, but from place

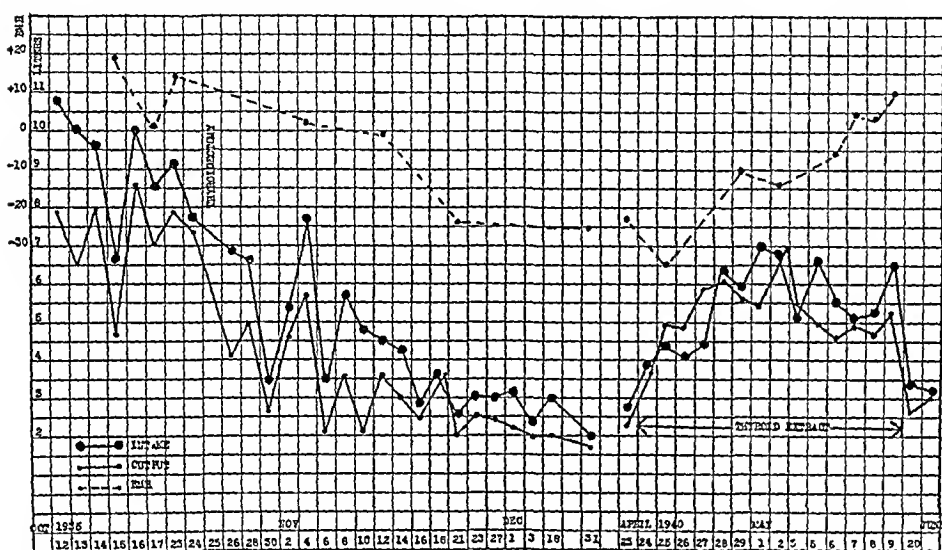


Chart 2 (case 3).—Effect of total thyroidectomy and of the subsequent intake of thyroid on the intake and output of fluid. Thirty-nine hundredths Gm. of thyroid was taken daily for the first nine days and 0.52 Gm. for the last six days.

hydrobromide hypodermically three to four times daily for relief of the parkinsonism. The polyuria and polydipsia continued, and he urinated about fifteen times during the day and about ten times at night; the total volume of urine averaged about 9 liters a day. These symptoms were relieved with solution of posterior pituitary, which gave him headaches. The family and past histories were essentially negative.

Physical examination revealed nothing remarkable except the syndrome of paralysis agitans. There was a masklike expression of the face. The mouth was always open. There was a coarse, involuntary tremor of the left arm and the left leg which was constantly present when the arm and leg were at rest. The tremor disappeared with voluntary motion. The diagnosis was diabetes insipidus and postencephalitic paralysis agitans. Roentgenograms of the skull and pneumoencephalograms showed no signs of a tumor.

The patient was readmitted on Oct. 8, 1935 with the same history and symptoms as on the previous admission and was discharged on November 19. His height was 55 inches (165 cm.) and his weight 113 pounds (51 Kg.). The blood pressure was about 140 systolic and 80 diastolic. The various laboratory data before thyroidectomy are given in table 4 and appear within the normal range. Scopolamine hydrobromide was administered subcutaneously before the metabolism tests were done to control the tremors, and the results ranged from 0 to +19 per cent. No scopolamine hydrobromide was given before the first metabolism test, and the result was +68 per cent.

to place acidophil cells were scattered among them. The gland was well vascularized.

The various laboratory tests were repeated many times after operation, but the data collected on several occasions are also given in table 4. They show how the metabolism has decreased and how the cholesterol content of the blood has increased. The patient has myxedema but feels comfortable and does not take thyroid. His weight has increased from 113 pounds before operation to 198 pounds (90 Kg.) in April 1940. His basal metabolic rate on many occasions was -23 per cent. Roentgenograms of the heart taken in April 1940 showed it to be just above the limits of normal with prominence of the left ventricle. Fluoroscopic examination showed a regular beat of fair quality, not the usual poor beat of myxedema.

This patient was readmitted to the hospital on five occasions after thyroidectomy for periods ranging from four to nine weeks for study of the effect of thyroid, dinitrophenol and solution of posterior pituitary on his water balance. Briefly, the administration of thyroid alone increased the intake and output of fluid, as it did in the previous case. The details of these observations will be discussed with those of the second case.

#### EFFECT OF THYROID ON WATER BALANCE

In order to study the effect of the administration of thyroid on the water balance of these patients after

21. Findley, Thomas, Jr.: Thyroid-Pituitary Relationship in Diabetes Insipidus, *Ann. Int. Med.* **11**:701 (Nov.) 1937.



reported a case of diabetes insipidus in which total thyroidectomy had no appreciable effect on the polydipsia and polyuria of the disease. There was no guaranty that all the thyroid tissue was removed. However, it was interesting that both of their patients had syphilis, which may have been a factor in their results.

The results in our 3 cases have shown that total thyroidectomy relieved the diabetes insipidus in 2 of 3

dence. In Findley's case<sup>21</sup> the thyroid gland was described as in an extreme resting phase which might be correlated with a decreased metabolism and was similar to the thyroids from hypophysectomized animals.

Tests were made in addition to show that the removal of the thyroid gland has an effect on the anterior lobe of the pituitary gland. These were done by determining the amount of the thyrotropic hormone in the blood and urine in case 3 seven months after thyroidectomy. Positive evidence of the excretion of thyrotropic hormone was found and, according to Hertz and Oastler, none is obtained normally.

When thyroid was administered to the patients some months after thyroidectomy the polyuria and the polydipsia were reestablished, but these were not as severe or as sustained as before the operation. Thyroid had a much greater effect on the water balance when the basal metabolism was at a low level for many months and not when immediately preceded by the administration of dinitrophenol or solution of posterior pituitary, after which thyroid had practically no significant diuretic response.

We suggest that there is a disturbance in the thyroid-pituitary relationship in diabetes insipidus which may play a part in the clinical aspects of the disease. Our observations have revealed that there is a definite relationship between thyroid activity and water balance. This may be specific and in the nature of an active diuretic principle and not due only to the ability of the thyroid gland to raise the basal metabolism as judged by the comparative responses of the intake and output of fluid to dinitrophenol and to thyroid in our cases. Furthermore, thyroid increased the intake and output before the metabolism became elevated; also they remained at an elevated level for some time after thyroid was omitted, even though the metabolism had decreased to its original low level.

It appears that in the normal person there is a normal balance between the secretions of the anterior and

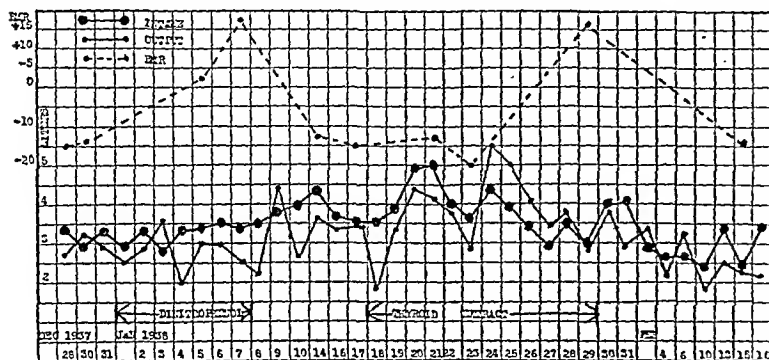


Chart 4 (case 2).—Comparative effects of dinitrophenol and subsequently of thyroid on the intake and output of fluid one and one-half years after total thyroidectomy. Two-tenths Gm. of dinitrophenol was given daily for the first four days, then 0.3 Gm. daily. Thyroid was given daily in doses of 0.13 Gm. for four days, 0.2 Gm. for three days and 0.4 Gm. for five days.

patients with this disease. In the first case of diabetes insipidus total thyroidectomy had no effect on the disease. However, in this case we believe that the patient has accessory thyroid tissue present because her metabolism and blood cholesterol level are much the same now as before the operation. In addition, she has shown no symptoms or signs of myxedema, even though she has taken no thyroid since the thyroidectomy. Blotner and Perkin<sup>22</sup> have studied the iodine metabolism in patients with diabetes insipidus and found an abnormal form of iodine metabolism with high and low levels of iodine in the blood and increased excretion of iodine in the urine. Furthermore, studies<sup>22</sup> on iodine in the blood and urine of this patient showed it to be the same as for the patients with diabetes insipidus who have their thyroid glands. Total thyroidectomy relieved the polyuria and polydipsia in the last 2 cases of diabetes insipidus, of postencephalitic origin, and also improved appreciably the Parkinson's disease. In these 2 cases, one parathyroid gland was also removed; whether the removal of one parathyroid gland in addition to the thyroid gland is a factor in the relief of the diabetes insipidus is questionable. The studies on iodine<sup>22</sup> in these 2 patients indicated that no thyroid tissue was present.

The pathologic condition of the thyroid gland in 2 of the cases indicated evidence of hyperactivity of this gland. Previously, the thyroid gland in diabetes insipidus has not been described as abnormal. However, in McConnell's<sup>18</sup> and McPhedran's cases<sup>19</sup> the abnormal thyroid glands were described as a coinci-

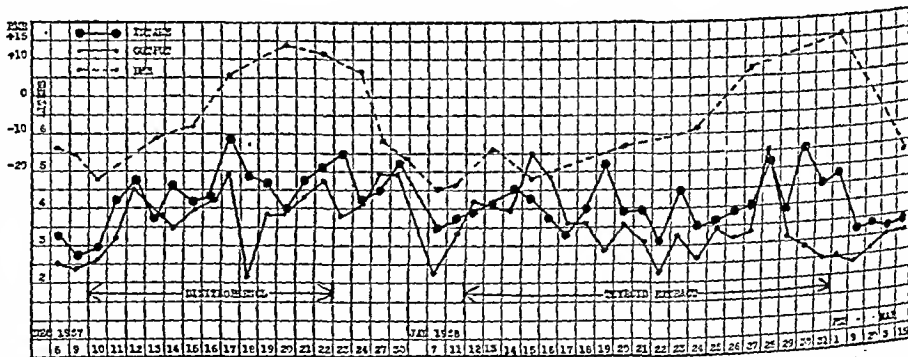


Chart 5 (case 3).—Relative effect of dinitrophenol and subsequently of thyroid on the intake and output of fluid more than two years after total thyroidectomy. One-tenth Gm. of dinitrophenol was given daily for the first five days and then 0.3 Gm. daily. Thyroid was given daily in doses of 0.2 Gm. for nine days, 0.3 Gm. for four days and 0.5 Gm. for seven days.

posterior lobes of the pituitary gland. In diabetes insipidus there appears to be a decreased secretion of the posterior lobe and an excess secretion of the anterior lobe. The hyperactivity of the thyroid gland may be due to stimulation resulting from increased activity of the anterior lobe of the pituitary and suggests the possibility that the diuretic effect of the anterior lobe of the pituitary gland is through its regulation of the thyroid. This is suggested also by

22. Blotner, Harry, and Perkin, H. J.: Blood and Urine Iodine in Patients with Diabetes Insipidus, lecture delivered at Peter Bent Brigham Hospital, March 5, 1940.

the animal experiments in which diuresis produced by the injection of solutions of the anterior lobe of the pituitary gland is abolished by thyroidectomy. These ideas do not interfere with the work of Ranson and his associates,<sup>23</sup> who showed how the supraoptic hypophyseal tract controls the secretion of the hormone of the posterior lobe.

The evidence in our studies justifies the application of thyroidectomy in patients with diabetes insipidus associated with postencephalitic Parkinson's disease.

#### SUMMARY

Total thyroidectomy was done on 3 patients with diabetes insipidus who have been observed for five years since the operation. The patients studied had acquired the disease many years previous to our investigations and consisted of 1 elderly woman whose diabetes insipidus was idiopathic and 2 young men whose disease was associated with postencephalitic Parkinson's disease.

Total thyroidectomy relieved the diabetes insipidus in the 2 cases of postencephalitic origin and also improved the Parkinson's disease. Total thyroidectomy had no effect on the diabetes insipidus of the first patient, whose disease was idiopathic. However, we believe that this patient has accessory thyroid tissue because of her normal basal metabolism, the lack of symptoms and signs of myxedema and because of the levels of cholesterol and iodine in her blood.

The administration of thyroid, when not recently preceded by dinitrophenol, reestablished the polyuria and polydipsia, but these were not as severe or as persistent as they had been before total thyroidectomy. The diuretic effect of thyroid appears somewhat spe-

TABLE 4.—Laboratory Data in Case 3 Before and After Total Thyroidectomy

	Before Operation	After Operation		
		8 Mos.	2½ Yrs.	4½ Yrs.
Basal metabolic rate.....	0 to +19	-15	-22	-23
Serum				
Calcium.....	10.3	9.8	10.1	10.6
Phosphorus.....	3.4	3.8	3.8	3.0
Protein.....	6.1	6.3	6.8	7.4
Albumin.....	3.5	3.7	3.9	4.8
Globulin.....	2.6	2.6	2.9	2.6
Sodium chloride.....	630	620	620	603
Cholesterol.....	189	334	276	443
Sugar.....	99	72	89	89
Nonprotein nitrogen.....	27	25	30	...
Hematocrit				
Corpuscles.....	42%	43%	44%	44%
Plasma.....	58%	57%	56%	56%
Weight in pounds.....	113	139	190	198
Erythrocytes.....	4.65	4.65	4.40	5.00
Hemoglobin, percentage.....	80	80	80	95

cific, in the nature of a diuretic principle, and is not due particularly to its ability to raise the basal metabolism. This was suggested by the occurrence of an increased intake and output of fluid while the metabolism was still low after thyroid medication and by the comparative response of the water exchange to dinitrophenol and to thyroid.

Studies of the thyroid gland in 2 cases indicate some hyperactivity of this gland. It is suggested that the thyroid gland plays a part in the clinical aspects of diabetes insipidus.

The evidence in our studies justifies the application of total thyroidectomy in cases of diabetes insipidus associated with postencephalitic Parkinson's disease.

721 Huntington Avenue.

23. Fisher, Charles; Ingram, W. R., and Ranson, S. W.: Diabetes Insipidus and the Neuro-Hormonal Control of Water Balance, Ann Arbor, Mich., Edwards Brothers, Inc., 1938.

## ROENTGENOGRAPHIC DIAGNOSIS OF CONGENITAL SYPHILIS

IN UNERUPTED PERMANENT TEETH

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AND

ROBERT HEUPEL, D.D.S.

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This report demonstrates the value of routine intra-oral roentgenograms of unerupted permanent teeth as an aid in the early diagnosis of congenital syphilis.

The growing teeth, like the bones and other organs, may be affected in congenital syphilis. Hutchinson<sup>1</sup> described the screwdriver-shaped and notched permanent upper central incisors as the most common and characteristic clinical dental abnormality. A roentgenographic diagnosis of unerupted Hutchinson incisors was

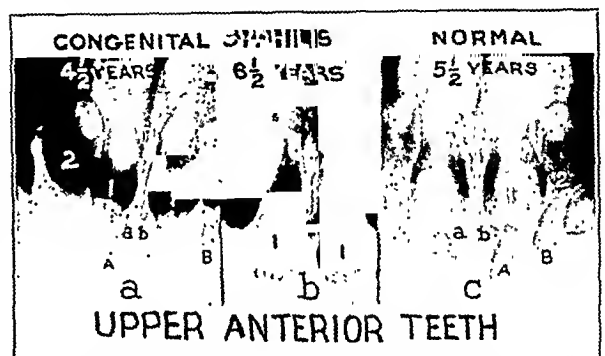


Fig. 1.—(a) Deciduous central (A) and lateral (B) incisors. Unrupted permanent central (I) incisor. Note the convergence of the proximal surfaces at about the midcoronal level. The incisal third is irregular in density. The upper lateral incisors (2) are not affected. ab, alveolar bone. (b) The central incisors have erupted. The coronal portion is similar to that in figure 1 a. The roots are now nearly completely formed and calcified. (c) Note the normal contour of the crowns and divergence of the proximal surfaces. Compare figure 1 a and b.

made first by Stokes and Gardner<sup>2</sup> in a patient aged 5 years and subsequently by Meyer-Buley<sup>3</sup> in a patient aged 2 years. Quinlan<sup>4</sup> and others<sup>5</sup> have reported similar diagnoses. While Moon<sup>6</sup> described a characteristic clinical appearance in the permanent first molars, roentgenograms of these teeth prior to eruption have been reported by Pincherle.<sup>6a</sup>

#### REPORT OF CASE

**History.**—J. W., a Negro girl, born Jan. 8, 1934, apparently had brouchopneumonia during infancy and possibly rickets. A

From the Department of Histology, College of Dentistry, University of Illinois (Drs. Sarnat and Schour) and the Dental Division, Children's Memorial Hospital (Dr. Heupel).

1. Hutchinson, Jonathan: Report on the Effects of Infantile Syphilis in Marring the Development of the Teeth, Tr. Path. Soc. London 9: 449, 1858.

2. Stokes, J. H., and Gardner, B. S.: The Demonstration of Unrupted Hutchinson's Teeth by the Roentgen Ray, J. A. M. A. 80: 28 (Jan. 6) 1923.

3. Meyer-Buley, H.: Die Frühdiagnose von noch im Kiefer verborgenen Hutchinson-Zähnen mit Hilfe des Röntgenbildes, Dermat. Ztschr. 58: 313 (June 30) 1930.

4. Quinlan, R. V.: The Teeth in Cases of Congenital Syphilis: Roentgen-Ray Studies of Unrupted Teeth, Arch. Dermat. & Syph. 10: 605 (Nov.) 1927.

5. Pitts, A. T.: Discussion on Oral Manifestations of Systemic Disease in Children, Brit. Dent. J. 48: 1191 (Oct.) 1927. Brown, G. V. L.: The Surgery of Oral and Facial Diseases and Malformations, Philadelphia, Lea & Febiger, 1933, p. 73. Morgan, G. E.: What Procedures Should Be Followed for Early Detection and Correction of Defects in Deciduous and Permanent Teeth? J. Am. Dent. A. 26: 378 (March) 1939.

6. Moon, Henri, cited by Karnosh, L. J.: Histopathology of Syphilitic Hypoplasia of the Teeth, Arch. Dermat. & Syph. 13: 25 (Jan.) 1926.

6a. Pincherle, B.: Congenital Syphilis Causing Dental Dystrophy: Hutchinson's and Moon's Teeth, Minerva Med. 2: 8 (July 8) 1937.

diagnosis of congenital syphilis was made March 27, 1936. Roentgenograms of the long bones were of no diagnostic aid. Treatment had consisted of acetarsone alternated with bismuth salicylate. Interstitial keratitis or deafness due to a lesion of the auditory nerve was not found.

**Dental Condition.**—Intraoral examination in 1938 revealed the presence of all the deciduous teeth with the exception of the lower incisors. The coronal portion of the upper incisors was worn to the gingival level. Aplasia of the enamel of the cuspid

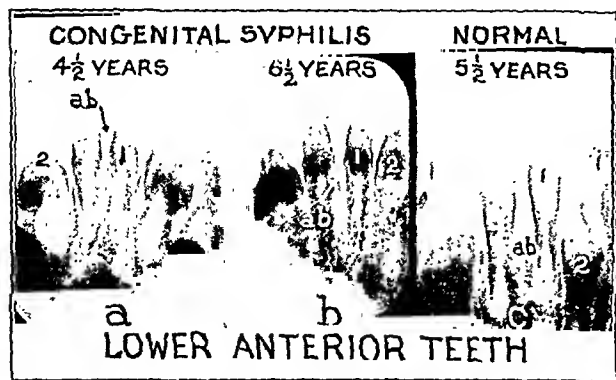


Fig. 2.—(a and b) The changes in the central (1) and lateral (2) incisors are similar to those in the upper permanent central incisors in figure 1 a and b. Note the similar convergence of proximal surfaces of crowns in unerupted (a) and erupted (b) teeth and the progress of the formation of roots. (c) Note the normal contour of the crowns and divergence of the proximal surfaces. Compare with figure 2 a and b.

and molar teeth had occurred during the neonatal period and earliest infancy. No permanent teeth were present in the oral cavity.

**Upper Anterior Teeth:** Examination of the roentgenograms (fig. 1 a) confirmed the clinical observations and in addition showed a screwdriver appearance of the crowns of the unerupted permanent central incisors. The proximal surfaces began to converge at about the midcoronal level. In addition, the incisal third was irregular in density. The cuspids were also affected. The lateral incisors were normal.

In July 1940 clinical examination revealed a typical screwdriver appearance of the crown. The incisal third was pitted and narrower than normal in the mesial and distal diameters. The roentgenograms at this time were similar to those of 1938 except that dental formation, calcification and eruption had progressed (fig. 1 b). The coronal portions of the teeth remained unchanged and showed a distinct convergence, in contrast to

**Permanent First Molars:** Roentgenograms of all of the unerupted permanent first molars in 1938 showed a convergence of the proximal surfaces toward the occlusal, so that the mesiodistal diameter was less than normal. The occlusal surface was irregular (fig. 3 a).

Clinical examination of the same teeth in 1940 showed a constriction of the occlusal surface. The cusps were worn, flat and close together. Roentgenograms taken at this time were similar to those taken in 1938 but showed the growth, calcification, eruption and attrition that had since occurred (fig. 3 b). A comparison of the normal permanent second molar with the affected permanent first molar showed distinct differences in the contour and size of the crown (fig. 3 b).

The roentgenographic diagnosis of congenital syphilis on the basis of the abnormalities of the permanent incisors and molars made in 1938 was thus confirmed by clinical examination in 1940.

Since these changes occurred in early infancy, they are manifestations of early and not of late congenital syphilis, as has been commonly believed.

#### COMMENT

The presence of Hutchinson incisors does not necessarily mean that the permanent first molars need be affected. In previous roentgenographic reports, except one by Pincherle,<sup>6a</sup> apparently only the upper permanent central incisors were affected.

The Hutchinson incisor owes its characteristic shape to a disturbance which occurs early in dental develop-

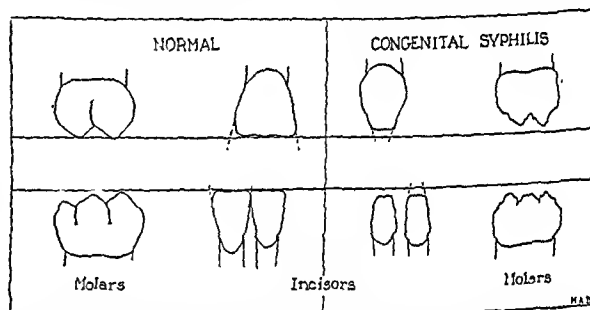


Fig. 4.—Diagrammatic representation of the gross morphologic characteristics observed in the teeth of the patient with congenital syphilis, compared with a normal control.

ment in congenital syphilis.<sup>7</sup> This is at the period of morphodifferentiation when the pattern of the dentino-enamel junction (and the future crown of the tooth) is being established. The apposition of enamel which occurs later follows the pattern of the dentino-enamel junction and proceeds normally. Clinically the enamel surface is smooth.<sup>7</sup>

The affected teeth of the patient described show alterations in two different phases of dental development, depending on the developmental stage which obtained at the time of the disturbance. The first is one of disturbed differentiation, in which the basic morphologic pattern of the tooth is affected, giving a convergence of the proximal surfaces of the permanent incisors and molars. Only these teeth are affected in the manner described because they are in the stage of morphodifferentiation at the neonatal period and in earliest infancy, when congenital syphilis is probably most active. Thus the permanent upper lateral incisors are normal because their development occurs at a later period (ten to twelve months).

7. Karnosh, L. J.: Histopathology of Syphilitic Hypoplasia of the Teeth, Arch. Dermat. & Syph. 13:25 (Jan.) 1926. de Jonge-Cohen, T. E.: Hutchinson's Tooth: Dental Reduction (Aplasia of Medial Edge Tubercle) from Viewpoint of Normal and Pathologic Anatomy, Nederl. tijdschr. v. geneesk. 76:2208 (May 7) 1932. Sarnat, B. G., and Shaw, N. G.: Dental Findings in Congenital Syphilis, to be published.

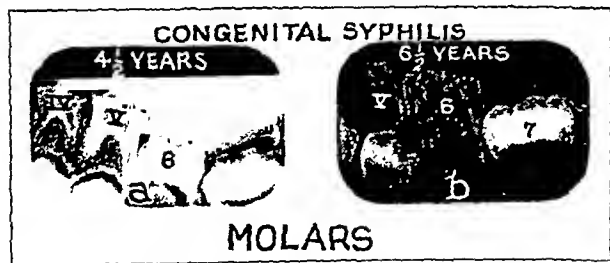


Fig. 3.—(a) The erupted deciduous first (1V) and second (V) molars show aplasia of the enamel such as occurs in the neonatal period and in earliest infancy. Note the occlusal convergence of the proximal surfaces and the irregular occlusal region in the unerupted permanent first molar (6). (b) Note the erupted permanent first molar, which differs from figure 3 a in that the cusps have been abraded and the occlusal surface is relatively flat. Compare with normal unerupted permanent second molar (7) as to size and contour.

the characteristic normal divergence of the proximal surfaces toward the incisal edge (figs. 1 c and 4).

**Lower Anterior Teeth:** The roentgenographic and clinical appearance of the permanent central and lateral incisors was similar to that of the upper permanent central incisors and also differed distinctly from the normal (fig. 2 a, b, c). In the cuspids a small portion of the incisal edge was affected.

The second stage is one of hypoplasia or disturbed apposition in the enamel of the deciduous teeth. These teeth are still active in the formation of enamel and reflect the disturbance in this structure. They do not show disturbed morphodifferentiation because this stage is completed before the neonatal period.

The changes in the teeth are permanent<sup>8</sup> while those in bone are subject to resorption. Recently, however, the interpretation of the condition of bone in cases of early congenital syphilis has been questioned.<sup>9</sup> It is interesting that roentgenograms taken of the long bones when the patient was 2 years old were of no diagnostic value. Had intraoral roentgenograms been taken the diagnosis of congenital syphilis could have been confirmed by the dental abnormalities.

After the disturbed neonatal period and earliest infancy another metabolic upset occurred (about three to ten months), as evidenced by the pitted type of hypoplasia of the enamel (chronologic aplasia of the enamel) on the permanent teeth.<sup>10</sup> This is not a frequent condition in congenital syphilis and was probably due in this instance to the bronchopneumonia during infancy or to infantile rickets.

#### SUMMARY

1. An early roentgenographic diagnosis of congenital syphilis on the unerupted permanent central incisors and first molars of a Negro girl aged 4 years was made and confirmed clinically two years later when the teeth had appeared in the oral cavity.

2. The teeth showed disturbances in the developmental phases which occur during the neonatal period and earliest infancy. The effects were different in the growing deciduous and permanent teeth, depending on the developmental stage active at the time. The deciduous teeth, active in the formation of enamel, showed hypoplasia; the permanent teeth, active in morphodifferentiation, showed a disturbed dentino-enamel junction with a resulting characteristic distortion of the crown.

3. In addition, the presence of hypoplasia of the enamel, in the permanent teeth was probably the record of another systemic disturbance which had been present from about the third to the tenth month.

4. The conditions of the teeth are permanent and not subject to change as they are in the bones.

5. Roentgenograms of the unerupted permanent teeth as well as of the long bones should be used as an aid in the early diagnosis of congenital syphilis.

808 South Wood Street.

8. Schour, Isaac: Calcium Metabolism and Teeth, *J. A. M. A.* **110**: 870 (March 19) 1938. Sarnat, B. G.: The Teeth as Permanent Chronologic Recorders of Systemic Disease: A Clinical and Experimental Study of Enamel Hypoplasia, *Proc. Inst. Med., Chicago* **13**: 114 (May) 1940.

9. Caffey, J.: Syphilis of the Skeleton in Early Infancy, *Am. J. Roentgenol.* **42**: 637 (Nov.) 1939. Evans, W. A., Jr.: Syphilis of the Bones in Infancy, *J. A. M. A.* **115**: 197 (July 20) 1940.

10. Sarnat, B. G., and Schour, Isaac: Enamel Hypoplasia (Chronologic Enamel Aplasia) in Relation to Systemic Disease: A Chronologic, Morphologic and Etiologic Classification, *J. Am. Dent. A.*, to be published.

**Beginning of Modern Chemistry.**—Modern chemistry begins with Lavoisier (1743-1794). His was the honor of overthrowing the incubus of the phlogiston theory and establishing the modern theory of combustion; of placing chemical experiments on a quantitative basis and so of securing the acceptance of the law of conservation of mass; of founding the modern system of nomenclature by which the composition of a substance may be recognized from its name; and of gaining the widespread acceptance of Boyle's definition of an element. Any one of these contributions would have insured his fame.—Timm, John A., in *Development of the Sciences*, New Haven, Conn., Yale University Press, 1941.

## ARTIFICIAL INSEMINATION

PRESENT STATUS IN THE UNITED STATES  
AS SHOWN BY A RECENT SURVEY

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AND

ALFRED KOERNER, M.D.

NEW YORK

On the completion of the recent survey of the status of artificial insemination in the United States sponsored by the National Research Foundation for Eugenic Alleviation of Sterility, Inc., the following facts were disclosed.

Thirty thousand physicians in this country were circularized. They were chosen because of the nature of their work and their association with a type of practice in which occasion to use artificial insemination might arise. Seven thousand, six hundred and forty-two replies were received. These bore witness to the fact that 9,489 women had achieved at least one pregnancy by this method. Almost two thirds of all the successful pregnancies were effected through the use of the husband's semen alone; of these, 3,569 resulted in boys, while 2,271 resulted in girls. Donors were used successfully in 3,649 pregnancies, of which 2,107

#### *Relationship of Pregnancies to Number of Inseminations*

No. of Pregnancies Resulting	No. of Inseminations Employed
3	1
17	2
409	3
61	8
897	9
4,312	12
1,916	14
1,003	15
367	18
139	20
241	21
124	21+

resulted in boys and 1,542 in girls. Figure 1 depicts this situation graphically.

More than 97 per cent of all the pregnancies resulting from artificial insemination terminated in living, normal babies. The remainder included 217 miscarriages and abortions, this incidence being only one fifth or less than that among so-called normal women in whom pregnancies result without aid. There were 22 extrauterine pregnancies in the series, which is only one sixth that of the number which would be expected in an average series of pregnancies. In every case the living children were normal in every respect and by every criterion.

Artificial insemination was employed so successfully that in 1,357 patients more than one pregnancy was effected by this means. The grand total of children sired by the method and here reported is nearly 9,500. The greatest success (45 per cent of pregnancies) occurred in those cases in which twelve inseminations were used. The 4,049 physicians reporting the 9,489 pregnancies required inseminations varying in number from one to seventy-two, as shown in the accompanying table.

In 40 per cent of all inseminations some solution was reported added to the specimen. Frequently operations are employed to cure sterility and make impregnation possible. Nearly four hundred surgical operations

were prevented by the use of artificial insemination (fig. 2). This means that there were nearly twenty-five times as many pregnancies as the total number of cases in which operation had to be considered. More than seventeen times as many operations were avoided as the total number of extrauterine pregnancies occurring in the series, while the relationship to the number of still-births was even more striking (32 to 1).

Two thousand, four hundred and seventy-eight physicians never had occasion to use artificial insemination, while 1,115 failed to obtain any pregnancy (fig. 3). When one considers that in a normal couple with normal marital relationships a pregnancy is often not induced until fifteen months have elapsed, it is easily understood why 1,115 reported failure. To be successful in artificial insemination, perseverance must be exercised by both patient and operator.

Of the 1,115 who failed to obtain a pregnancy by artificial insemination, 50 gave no specific number of inseminations used. The other 1,065 physicians answered as follows: Seven hundred and forty tried one insemination, 111 tried two, 91 tried three, 83 tried four, 7 tried five and 33 tried six inseminations.

Throughout the literature there have been many reports of failure and skepticism as to the value of artificial insemination. A careful analysis of these articles, however, will reveal the reasons for failure. Just such a report appeared in a leading medical

includes, among other things, the establishment of tubal patency, ascertaining the normality of the female endocrine system and procuring satisfactory seminal specimens from an acceptable source. It is doubtless the physician's responsibility to see to it that the full benefit of modern medical knowledge is given to the patient.

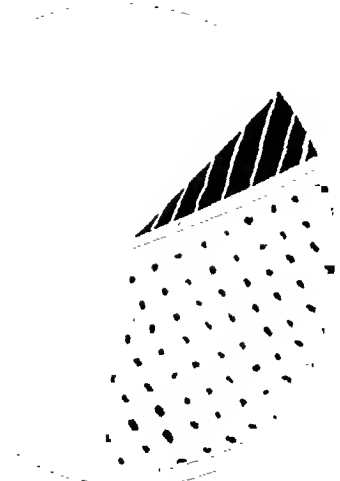


Fig. 2.—Complications with artificial insemination as compared with a normal series of pregnancies. Solid black represents three hundred and eighty-two operations which were made unnecessary by the use of artificial insemination to effect pregnancy; diagonal stripe section represents twenty-two extrauterine pregnancies reported in the series, which are one hundred and ten less than in a normal series of similar number. The dotted field represents two hundred and seventeen miscarriages, or 2.3 per cent reported, whereas in a similar number of normal pregnancies the incidence is as great as 10 to 20 per cent.

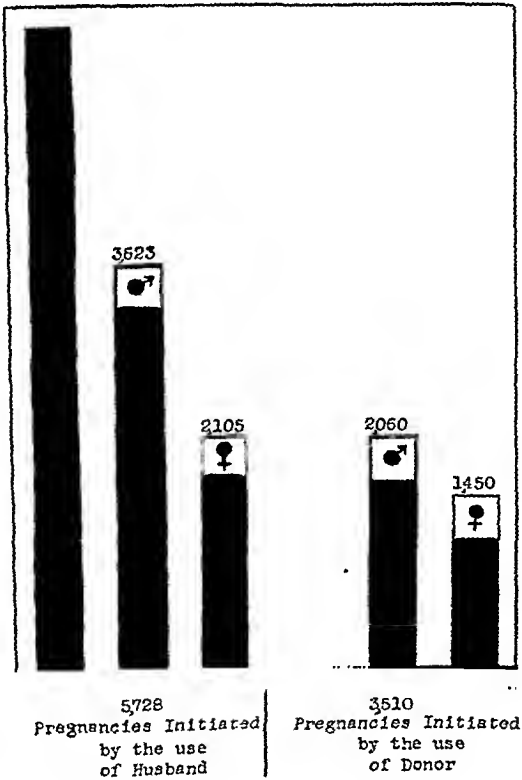


Fig. 1.—Viable pregnancies initiated by the use of artificial insemination; ♂ indicates boys and ♀ girls.

The case report continued by stating that the patient was "uncooperative." Cooperation and absolute confidence between physician and patient are required at all times to insure success. "The specimen was sent by messenger without date . . ." To be certain of delivery of authentic specimens from either husband or donor, messengers, when used at all, are chosen most carefully. Arrangements included "selection of the donor by the family." For obvious reasons no choice of donor by the family is permitted. The physician alone has this responsibility as well as that which goes with the whole case.

A fair appraisal of artificial insemination can be obtained only after careful and controlled work. As has been pointed out, many normal newly wed couples do not effect pregnancy until many months of married life have elapsed. Therefore 100 per cent success is not expected from any method, not even from artificial insemination, especially when one's efforts are abandoned after from one to six attempts at insemination.

Because of the lack of absolute knowledge of the time of ovulation in the human being, no case should be considered hopeless until an adequate period of trial has elapsed. A three year period with an average of three inseminations a month should be established, since that would be twice as long as is allowed for unaided pregnancy before the couple is considered sterile. If such cases had not been persisted in, pregnancy would never have ensued, and failure would have been attributed to artificial insemination. Such, in fact, was the case with each of the 1,115 failures reported in this survey.

Only a handful of "flare-ups" resulted through the use of uterosalpingography (less than 0.5 per cent of pregnancies). This is a point that should be par-

journal this year. One should consider the reasons for the author's large percentage of failures out of a total of 35 reported cases. The report stated that "preliminary study was inadequate." Unless a case is thoroughly worked up, success from artificial insemination cannot be expected. Adequate preliminary study



ticularly emphasized. Of these, in only 9 was operative intervention required. In the past, certain observers in the literature on sterility have felt themselves forced to write with trepidation of their experiences with uterosalpingography. Now there is no longer any need for such a pessimistic point of view provided the operator chooses his cases with care and employs an accepted technic.

Figure 4 shows the distribution of children who have been sired by artificial insemination. The Central and Atlantic Seaboard sections of the country preponderate in this respect. It is evident that certain sections of the country have been more alert in accepting the usefulness of and employing this new addition to the medical armamentarium. It is to be hoped that the results of this survey will win new friends for this procedure whenever and wherever the need for its use may arise.

#### SUMMARY

Of nearly ten thousand pregnancies that were obtained through artificial insemination, two thirds were effected through utilization of the husband's semen alone.

The proportion of boys to girls resulting was roughly 8 to 5 when the husband's semen was used and 7 to 5 when a donor's was used.

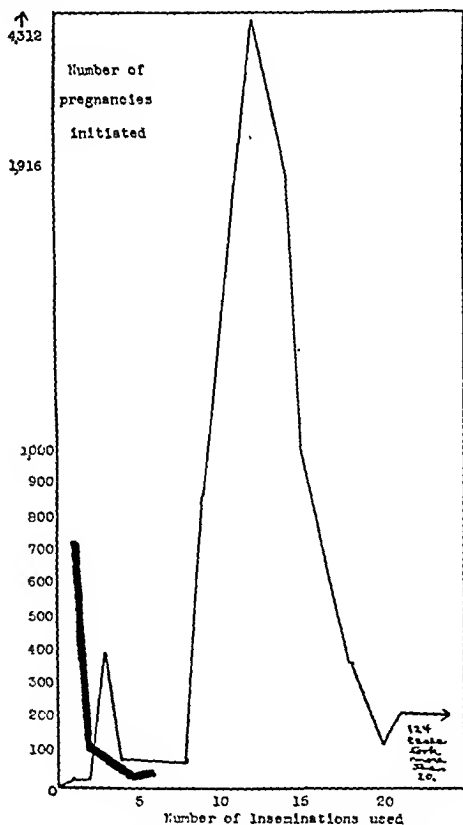


Fig. 3.—Number of pregnancies initiated with regard to number of inseminations made. Fine black line indicates 9,489 reported pregnancies by artificial insemination, and heavy black line represents 1,115 patients who reported failure with artificial insemination.

Ninety-seven per cent of pregnancies initiated by artificial insemination resulted in live babies.

The incidence of miscarriages and abortions was only one fifth that occurring normally in the population taken

as a whole in areas where artificial insemination is not practiced.

The incidence of extrauterine pregnancies was only one sixth that occurring normally.

The occurrence of stillbirths was practically negligible.

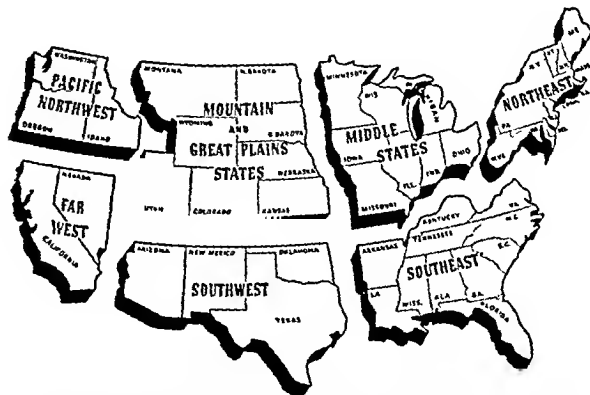


Fig. 4.—Geographic distribution of 9,238 children conceived by artificial insemination: Northeast, 4,260; Southeast, 1,663; Middle states, 2,403; Southwest, 58; Mountain and Great Plains states, 141; Far West, 617, and Pacific Northwest, 96.

“Flare-ups” from uterosalpingography were few and were mostly of a transitory nature.

All living children were born normal in every respect.

One thousand, three hundred and fifty-seven women had repeated pregnancies by artificial insemination.

Nearly ten thousand children were brought into the world by the aid of this procedure.

Forty-five per cent of all pregnancies occurred in cases in which twelve inseminations were employed.

Nearly four hundred surgical operations were prevented because of the use of artificial insemination.

The principal causes of failure can be removed if inadequate preliminary study of the case, lack of cooperation of the patient, unreliable messengers, the use of imperfect seminal specimens and the lack of perseverance on the part of the physician in his attempts at insemination are eradicated.

Successful pregnancies were reported with inseminations varying in number from one to seventy-two.

The Central and Atlantic Seaboard sections have the greatest number of children sired by artificial insemination as well as the largest success with this procedure.

53 East Ninety-Sixth Street.

**Protection Against Hemorrhagic Disease.**—Vitamin K is the name of a group of substances which protect man and the higher animals against a well characterized hemorrhagic disease. The most important members of this group are vitamin K<sub>1</sub>, from green leaves, and vitamin K<sub>2</sub>, which is formed by bacteria. Both substances are lipoids. . . . In the vegetable kingdom vitamin K is principally found in all kinds of green leaves. This source contains several hundred units per gram dry weight. Fruits are rather poor sources—an exception is tomatoes. . . . Treatment with vitamin K is now used in all cases where patients with obstructive jaundice are operated, and the risk of bleeding as a consequence of the surgical operation is thereby completely eliminated.—Dam, Henrik: Factors in Preventing the Blood from Leaving the Vascular System, *Quart. Bull. Indiana Univ. Med. Center*, April 1941.

TETANUS FOLLOWING INDUCED  
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Tetanus following induced abortion appears to be a rare condition, or at least if it is common it has not been reported. In 1931 Mattson and Starkey<sup>1</sup> reported 1 case, with recovery. Komaromy<sup>2</sup> reported 1 case in 1937 and stated that there were numerous cases reported in the literature. In the German literature, Schneider was able to find records of 111 cases, with a mortality of 91 per cent. Komaromy brought out the fact that it is essential to determine whether the inoculation with tetanus took place through other wounds in the skin and was merely coincidental with the abortion. As a result of a survey of the literature, I think it is justifiable to report 5 cases, with a mortality of 100 per cent.

The 5 patients admitted having been pregnant and having sought an abortion and alleged that the abortion was done by the same person in all cases.

## REPORT OF CASES

**CASE 1.—History.**—A white woman aged 22 was admitted on Aug. 11, 1940 complaining of stiffness of the neck and jaws. She gave a history of having not menstruated for three months and of consulting a physician requesting an abortion. She stated that a pack was placed in the uterus and that on the following day she began to bleed and had a severe chill. Four days afterward, she was unable to open her jaws and her neck became stiff. She gave no history of injuries such as punctured wounds or foreign bodies in the skin for the month preceding this illness.

Physical examination on admission revealed the temperature to be 98.6 F., the pulse rate 72 and the respiratory rate 16. The physical examination revealed nothing abnormal except inability to open the jaws over  $\frac{1}{2}$  inch (1.2 cm.), hyperactive knee jerks and tenderness over the region of the bladder. The red blood cell count was 4,600,000. The hemoglobin content was 90 per cent. The white blood cell count was 8,000, with 1 per cent eosinophils, no basophils, 13 per cent stab cells, 58 per cent segmented cells, 24 per cent lymphocytes and 4 per cent monocytes. The urine was normal. The Kahn, Kolmer and Hinton reactions were negative. Examination of the spinal fluid was not done.

**Course.**—The temperature, pulse rate and respiratory rate began to increase on the second day after admission, and convulsions began and increased in number and severity; she died on the fifth day after admission. Edema of the lungs was apparently a terminal complication.

**Treatment.**—The patient received a total of 180,000 units of tetanus antitoxin in doses of 20,000 units given intravenously twice daily. She also received avertin with amylene hydrate rectally for sedation, 50 per cent magnesium sulfate intramuscularly and 1,000 cc. of 5 per cent dextrose in saline solution intravenously every eight hours.

**CASE 2.—History.**—A white woman aged 22 was admitted on Aug. 12, 1940 complaining of flooding and cramping in the lower part of the abdomen. She was about six weeks pregnant when she consulted a physician, requesting that an abortion be done, and a pack was placed in her cervix. This was done about six days before her admission to the hospital. She bled a moderate amount for the first four days and then began to bleed profusely and passed large clots. For eighteen hours before admission she had noted pains in her neck and jaws.

The rest of the history was irrelevant except for the fact that she had not suffered a punctured wound or other injuries for the preceding thirty days.

**Physical Examination.**—The temperature on admission was 99.6 F., the pulse rate 90 and the respiratory rate 20. Physical examination showed her to be normal except for rigidity of the muscles of the neck and jaw, exaggeration of the knee jerks, an enlarged, tender uterus, and a foul-smelling bloody vaginal discharge. The patient was unable to open her mouth more than  $\frac{1}{4}$  inch (0.6 cm.).

The white blood cell count was 10,000, with no eosinophils, 1 per cent myelocytes, 3 per cent juvenile cells, 44 per cent stab cells, 40 per cent segmented cells, 9 per cent lymphocytes and 3 per cent monocytes. The urine was normal. The spinal fluid was clear and colorless, the cell count was 1 and the globulin and Kolmer reactions were negative.

**Course.**—The patient began to complain of severe pain in the neck and jaws soon after admission, and on the following morning she was stuporous. No convulsions occurred until eighteen hours after admission. The temperature ranged from 100 to 101 F., and the pulse rate ranged around 120. On the following day, her condition remained unchanged except that the temperature was 102 F. most of the day and she was unconscious throughout the day. The respiration was normal and the chest clear. She had several convulsions during the day, and suddenly about 2:15 the following morning she died. The cause of death could not be determined but was attributed to cardiovascular collapse or respiratory paralysis.

**Treatment.**—The patient received 180,000 units of tetanus antitoxin intravenously in doses of 20,000 units every twelve hours and one dose of 20,000 units intramuscularly on admission. Sodium amytal was given in doses of 6 grains (0.4 Gm.) every four hours by rectum for the first twenty-four hours, and then avertin with amylene hydrate was given by rectum every four to six hours for sedation. She also received  $\frac{1}{4}$  grain (0.016 Gm.) of morphine sulfate for restlessness and 10 cc. of a 10 per cent solution of magnesium sulfate intravenously twice a day. She received 1,000 cc. of 5 per cent dextrose in saline solution every eight hours intravenously.

**CASE 3.—History.**—A white woman aged 33 was admitted Aug. 22, 1940 complaining of stiffness and soreness in the jaws. The patient had passed her menstrual period only a few days when she consulted a physician, who placed a pack in the neck of the uterus. This had been done seven days prior to admission to the hospital. Her first symptoms were noticed on the day before admission. A history of any other wound or injury during the past three weeks could not be elicited.

Physical examination revealed the usual symptoms of tetanus, namely stiffness of the jaws, rigidity of the muscles of the neck, slight spasticity of the abdominal muscles and exaggeration of the knee jerks.

There were 9,500 white blood cells, with 1 per cent juvenile cells, 25 per cent stab cells, 59 per cent segmented cells and 15 per cent lymphocytes. The spinal fluid was not examined.

**Course and Treatment.**—The patient was handled somewhat differently from the other patients in this series. First, 60,000 units of tetanus antitoxin was given by vein and a moderately large dose of avertin with amylene hydrate was given by rectum. Then the patient was taken to the operating room, and a supravaginal hysterectomy was done, particular attention being given to preventing contamination of the peritoneum. The operative record stated that the uterus was slightly larger than normal and was in second degree retroversion. There was no induration of the tissue. The uterus and adnexa showed a slight degree of hyperemia. The pathologist reporting on the examination of the uterus stated that sections from it showed the endometrium to be fairly normal, not greatly congested, and the glandular structure normal. He stated that he could see nothing abnormal in this tissue and that he did not receive the impression that this had been a gravid uterus. The patient had a fairly normal twenty-four hours after the operation. During the day, she received 1,500 units of tetanus antitoxin, and this amount was given daily intramuscularly. On the day after operation, she also received 450 cc. of citrated blood and

The cases reported were taken from the gynecologic service of the Shannon West Texas Memorial Hospital.

1. Mattson, C. H., and Starkey, T. A.: Tetanus Following Induced Abortion, *Minnesota Med.* 14: 737 (Aug.) 1931.

2. Komaromy, G. G.: Tetanus Associated with Criminal Abortion, *Am. J. Obst. & Gynec.* 34: 687 (Oct.) 1937.

60 grains (4 Gm.) of sulfanilamide intravenously. Hypertonic magnesium sulfate solution was given intramuscularly every six hours. Morphine sulfate and avertin with amylene hydrate were given to control convulsions but were unsuccessful. The patient was given 500 cc. of a 20 per cent solution of dextrose in water intravenously every eight hours and was also given nasal feedings of egg albumin, milk and whisky. She received also three more transfusions of 300 cc. of citrated blood, and one dose of 30 grains (2 Gm.) of sulfathiazole was given by duodenal tube during the twenty-four hours. In all, the patient received 66,000 units of tetanus antitoxin. She died on the third day after admission and apparently ran the same type of course as the other patients in this series.

**CASE 4.—History.**—A white woman aged 20 was admitted on Aug. 23, 1940 complaining of severe pain in the head and neck. Six days before admission the patient had consulted a physician who placed a pack of gauze in the neck of the uterus. At this time, she thought that she was about two months pregnant. Since this packing, she had been passing clots of blood and had experienced cramping in the lower part of the abdomen. On the evening before admission, she noticed that her jaws were stiff but that there was no particular pain in them. The gauze pack was passed with numerous clots of blood shortly before admission. There was no history of any other injury or break in the skin for the month preceding the present illness.

Physical examination revealed the temperature to be 99 F., the pulse rate 102 and the respiratory rate 20. The mouth was tightly closed, and conversation was limited to movements of the lips. The jaws could not be opened more than  $\frac{1}{4}$  inch (0.6 cm.). The muscles of the neck were quite rigid and the head was held in opisthotonos. Rigidity of the abdomen was not noted, but there was a reflex spasm of the neck and jaws on pressure over the abdomen. The sacrospinalis and erector spinae muscles were rigid. The normal reflexes were present and no abnormal reflexes were noted. There was a foul, bloody vaginal discharge present.

The blood cell count revealed nothing other than mild anemia and a white cell count of 18,000 with a decided shift to the left. The spinal fluid was clear and colorless, and no cells were found. The Kolmer and Kahn reactions were negative, and otherwise the spinal fluid was normal.

**Course.**—On the day after admission, the patient passed a small piece of placental tissue, and she began to have convulsions soon afterward. On the third day, her chest became filled with coarse rales, the pulse rate and the respiratory rate increased rapidly and the abdomen became distended and rigid. She died on August 26.

**Treatment.**—In addition to the use of avertin with amylene hydrate by rectum every four hours, she received 10 per cent calcium gluconate in 1,000 cc. of 5 per cent dextrose in saline solution every eight hours. She was given 3,000 units of tetanus antitoxin intraspinally on admission and the same amount again intraspinally on the following day. During the three days time, she received 150,000 units of tetanus antitoxin intravenously and 10,000 units intramuscularly.

**CASE 5.—History.**—A white woman aged 34 was admitted Aug. 26, 1940 complaining of stiffness in the jaws and neck. She stated that she had missed two monthly periods and that she had requested a physician to perform an abortion. Three days later she had passed some large clots of blood and a piece of gauze, and on the day before admission she had begun to have stiffness of the muscles of the neck and jaws. There was no history of punctured wounds or other injuries for one month prior to the present illness.

Physical examination revealed stiffness of the muscles of the neck and jaw, and opisthotonos was present. The abdominal muscles were spastic. There was a foul bloody discharge from the vagina. No evidence of punctured or other wounds elsewhere on the body could be found. The temperature was 100.2 F., the pulse rate 120 and the respiratory rate 28 on admission.

**Course.**—During the first twenty-four hours, the patient had six convulsions and the course was steadily downhill, the pulse increasing and the respiration becoming rapid and shallow, and she died on the third day after admission.

**Treatment.**—This patient received 60,000 units of tetanus antitoxin intravenously on admission and 40,000 units the following day. Soluble phenobarbital was given in 5 grain (0.32 Gm.) doses every three hours for three doses, but this failed to control the convulsions. Then avertin with amylene hydrate was given by rectum every four hours, with fair results. The patient also received high voltage roentgen therapy to the pelvis on admission. (The dose was not stated.) One thousand cc. of 5 per cent dextrose in saline solution containing 30 grains (2 Gm.) of sulfanilamide was given every twelve hours intravenously. A 25 per cent solution of magnesium sulfate was given intramuscularly every four hours and was accompanied by  $\frac{1}{6}$  grain (0.01 Gm.) of morphine. She received also two transfusions of 250 cc. of citrated blood.

#### COMMENT

It is unusual, I believe, to see 5 patients with puerperal tetanus, all of whom had consulted the same physician within a period of two weeks and all of whom admitted having had a gauze pack placed in the cervix. All of them were admitted to the hospital within fifteen days; 4 died on the third day and 1 survived five days. Four patients had had the pack placed in the cervix six days prior to admission, and the fifth seven days before admission. The onset of the first symptoms in all except 1 of the patients was on the fifth day; 1 felt the first symptoms on the sixth day. The course of the disease was approximately identical in all cases, and no type of therapy apparently influenced the course.

I might say that the reason for the wide variation of the types of treatment given was that each patient was treated by a different private physician. The smallest total dose of antitoxin given was 66,000 units, and the largest was 180,000 units. Intraspinal antitoxin therapy was apparently of no value in the one case in which it was used but apparently did no harm. Various hypnotic and anesthetic drugs used in these cases universally failed to control the convulsions.

As to the causes of death, all the patients suffered embarrassment of respiration, edema of the lungs and collapse of the peripheral vascular system. One patient died suddenly, and the cause of death could not be determined accurately.

The 1 patient on whom supravaginal hysterectomy was done ran exactly the same course as the other patients in the series, and apparently the hysterectomy was of no avail. Her case was interesting because of the fact that the pathologist reported a normal endometrium, and moreover I have never been able to determine from the history or otherwise that she was pregnant.

I feel that all the patients described were infected with the same strain of tetanus bacilli and that it was an extremely virulent strain. I feel also that all the therapeutic measures at hand at the present time in the treatment of tetanus are of little value when the virulence of the organism is great.

I have learned that there were 2 other patients with tetanus who were not admitted to any hospital but who were supposedly infected from the same source, 1 of whom died on the fifth day following infection. The termination of the other case could not be definitely determined.

## Clinical Notes, Suggestions and New Instruments

### EFFECT OF THE FEEDING OF EGG YOLK POWDER ON BODY WEIGHT

ALFRED STEINER, M.D., NEW YORK

During the course of a study on the serum cholesterol in a series of patients<sup>1</sup> who were being fed on egg powder, it was observed that a gain in body weight occurred. This observation was of interest in view of the fact that previous efforts to improve the nutrition of the subjects under consideration by means of high caloric diets with vitamin supplements had failed. The results of the feeding of egg yolk powder on the body weight of 10 patients are presented here.

A group of 10 patients, 8 with rheumatoid arthritis<sup>2</sup> and 2 with chronic nephritis without edema, who had been previously hospitalized from two to six months, were observed during a control period of five weeks. A well balanced diet containing from 2,600 to 3,000 calories was fed to the patients during this period. Subsequently the patients were given diets containing from 1,900 to 2,500 calories plus 100 Gm. of egg yolk powder<sup>3</sup> for from four to fourteen weeks. One hundred Gm.

varied from zero to 16 pounds (7.3 Kg.), the average gain being 9½ pounds (4.3 Kg.). The average increase per week per person was therefore 1¼ pounds (0.6 Kg.). A total of 25½ and 15 pounds (11.5 and 6.8 Kg.) respectively was gained by 2 of the patients who received the egg yolk powder for two periods.

In only one instance did a patient fail to gain weight, and in this instance the egg yolk was discontinued after four weeks because it was not tolerated well; diarrhea developed on two occasions during the feeding.

It can be seen from the table that a factor other than caloric intake may play a part in the gain in weight induced by feeding of egg yolk powder. The caloric intake of 5 of the patients during the period of such feeding was slightly below that during the control period. The caloric intake of the 5 remaining patients during the period of feeding of egg yolk powder exceeded that during the control period by approximately 200 calories daily.

The status of rheumatoid arthritis in all the patients as measured by the sedimentation rate remained essentially unchanged during the period of feeding of egg yolk powder.

#### COMMENT

The addition of egg yolk powder to the diet resulted in a gain in weight in 9 of 10 persons. Some factor other than

*Effect on Body Weight of Ten Patients of Feeding of Egg Yolk Powder*

Patient	Age	Sex	Diagnosis	Control Diet, Calories	No. Weeks	Weight in Pounds				Diet and Egg Yolk Powder, Calories	No. Weeks	Weight in Pounds			
						Onset	End	Gain	Loss			Onset	End	Gain	Loss
1. H. T.	31	♂	Arthritis	3,000	5	110½	110	0	½	3,220	6	110	118	8	0
2. E. C.	38	♀	Arthritis	3,000	5	99½	99½	0	0	3,220	6	99½	103½	0	0
3. A. G.	37	♀	Arthritis	3,000	5	125	125	0	0	3,220	9	125	140	15	0
4. J. G.	29	♂	Arthritis	3,000	5	150	157	0	2	3,220	8	157	170	13	0
5. M. S. (a)	31	♀	Arthritis	3,000	5	104	104	0	0	3,220	8	104	116½	12½	0
M. S. (b)				3,000	16	116	112	0	4	3,220	6	112	125	13	0
6. M. M.	28	♀	Chronic nephritis	3,000	5	88	86	0	2	2,920	8	86	102	16	0
7. R. B.	34	♀	Arthritis	2,600	5	88	86	0	2	2,520	10	86	95	9	0
8. J. L. (a)	27	♀	Arthritis	3,000	5	96	96	0	0	3,220	14	96	106	10	0
J. L. (b)				2,700	3	94	94	0	0	2,620	5	94	99	5	0
9. M. S.	23	♀	Arthritis	2,700	5	99	97	0	2	2,620	9	97	105	8	0
10. M. P.	18	♀	Chronic nephritis	2,700	5	109	109	0	0	2,620	4	109	109	0	0
											7.7	9.6			

Actual caloric intake estimated.

of egg yolk powder, on analysis by the R. C. Williams Company, was found to contain 67 Gm. of fat and 22 Gm. of protein, or 620 calories. It was fed in portions of 50 Gm. suspended in milk, with vanilla and sugar added to taste. The total intake during the period of feeding egg yolk powder, therefore, varied from 2,620 to 3,220 calories. Two of the patients were fed egg yolk powder for a second period after an intervening control period.

The accompanying table shows the weights of the patients at the beginning and at the end of the control period and of the period of feeding of egg yolk powder, together with the caloric intake during each period. It can be seen from this table that during the control period in 6 instances a loss of weight occurred varying from ¼ pound to 4 pounds (113 Gm. to 1.8 Kg.). None of the patients gained weight during the control period.

During the periods of feeding egg yolk powder, which averaged seven and seven-tenths weeks, the gain in body weight

the caloric value of the egg yolk powder may play a part in the resultant increase in the nutrition of the body. Egg yolk powder is a rich source of vitamins A and D and the water-soluble fraction of the vitamin B complex. The cost of the egg yolk powder was 15.4 cents daily, or \$1.08 a week, for each patient.

From the data presented it would appear of value to add egg yolk powder to the list of agents used in stimulating an increase in body weight in special instances.

#### CONCLUSIONS

1. One hundred Gm. of egg yolk powder was fed to 10 patients, 8 with rheumatoid arthritis and 2 with chronic nephritis without edema, from four to sixteen weeks, with an average of seven and seven-tenths weeks.

2. A gain in body weight varying from 5 to 16 pounds occurred in 9 of the 10 persons. The average increase in weight for the group was 9½ pounds. During an initial control period none of the patients gained; 6 actually suffered a loss varying from ¼ to 4 pounds.

3. Egg yolk powder is an economical agent for increasing the nutrition of the body and is, in addition, a rich source of vitamins A and D and the water-soluble fraction of the vitamin B complex.

893 Park Avenue.

This investigation was aided in part by a grant from the Josiah Macy Jr. Foundation.

From the Research Service, First Medical Division, Welfare Hospital, Department of Hospitals, City of New York, and the Department of Medicine, Columbia University College of Physicians and Surgeons.

1. Steiner, Alfred, and Domanski, B.: *Dietary Hypercholesterolemia*, Am. J. M. Sc., to be published.

2. The patients with rheumatoid arthritis were members of a group studied by Dr. M. H. Dawson.

3. Made by R. C. Williams Company, New York.

## A NEW PORTABLE EMERGENCY TRANSFUSION KIT

JOHN R. UPTON, M.D.; B. E. EMERY, M.S., AND R. B. CLARK  
SAN FRANCISCO

We are presenting to the medical profession a small but very compact dried plasma transfusion emergency kit. We know its adoption will materially assist in forging a long sought therapeutic weapon for use by the Medical Corps of our armed forces. The adaptability of this kit for use in civilian practice is unlimited.

We do not intend to enumerate the many well proved and clinically sound reasons for the use of plasma or serum. Articles of great value are available to any reader interested in this new phase of blood plasma transfusion therapy.<sup>1</sup>

In these grim days the need for some fool-proof dependable transfusion outfit which can be set up by any doctor or well trained nurse and utilized at or near the site where the injury occurred is of tremendous importance. Army, navy, air force and even civilian casualties now can be treated immediately by drawing on supplies in strategically placed depots. Experience in the present war has already shown the urgent need for plasma transfusion in shock, burns and hemorrhage. If transfusion is delayed, inevitable and irreversible changes occur in a large proportion of cases. The need has always been present; recent medical advances now make it practical to fill the demand and in so doing many lives can be saved. The demands made on any product being subjected to conditions encountered in modern warfare are many and varied, but we believe the transfusion kit devised by us will more than meet the strict standards we have formulated. Changes in the kit will undoubtedly take place as time passes; we already have ironed out many wrinkles. In its present form a serviceable unit has been arrived at: it will do its bit.

The requirements are that:

1. The product must possess decided therapeutic advantages over the present commonly used substances.
2. The product to be injected intravenously must be absolutely sterile and not harmful to the recipient. The pyrogen free sterile water accompanying the kit should be used.
3. The product should be easy to administer under the most trying and difficult conditions by medical and nursing staffs not expertly trained in intravenous technic.
4. The transfusion unit must be of such a size that it can be easily transported in quantity by airplane; therefore weight and size are major factors.

From the Irwin Blood Bank of San Francisco County Medical Society, San Francisco (Dr. Upton), and the Cutter Laboratories, Berkeley, Calif. (B. E. Emery and R. B. Clark).

1. Articles on blood work:

- Knott, F. A., and Koerner, E. H.: Storage of Transfusion Plasma, *Lancet* 2: 1069-1071 (Nov. 18) 1939; two charts.  
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Aylward, F. X.; Mainwaring, B. R. S., and Wilkinson, J. F.: Effects of Some Preservatives on Stored Blood, *ibid.* 1: 685-687 (April 13) 1940; two illustrations, eighteen references.  
DeGowin, E. L., and Hardin, R. C.: Reactions from the Transfusion of Preserved Blood: Experience with 1,600 Transfusions, *Brit. M. J.* 2: 1-5 (July 6) 1940; twenty-five references.  
Levinson, S. O.; Newell, Frank, and Necheles, Heinrich, with the collaboration of D. J. Cohn, and the technical assistance of W. H. Olson, Grace Lawrence and William Scruggs: Human Serum as a Blood Substitute in the Treatment of Hemorrhage and Shock, *J. A. M. A.* 114: 455-461 (Feb. 10) 1940; two illustrations, twenty-five references.  
Flosdorf, E. W.; Stokes, F. J., and Mudd, Stuart: The Desirac Process for Drying from the Frozen State, *J. A. M. A.* 115: 1095 (Sept. 28) 1940.  
Bushby, S. R. M.; Buttle, G. A. H., and Whitby, L. E. H.: Small-Scale Filtration of Citrated Plasma, *Lancet* 2: 131-132 (Aug. 3) 1940.  
Minot, A. S., and Blalock, Alfred: Plasma Loss in Severe Dehydration, Shock and Other Conditions as Affected by Therapy, *Ann. Surg.* 112: 557-567 (Oct.) 1940; thirty-one references. Bulletin of War Medicine, Medical Research Council number 3, January 1941.  
Levinson, S. O.; Rubovits, F. E., Jr., and Necheles, Heinrich: Human Serum Transfusions, *J. A. M. A.* 115: 1163 (Oct. 5) 1940.

(Footnote 1 continued in next column)

5. The accompanying dispenser should be so constructed that the plasma can be given as a hypertonic, isotonic or hypotonic solution according to the type of injury encountered.

6. The product must be prepared and administered by the "closed system" technic—this to exclude any possibility of transference contamination.

7. The product, after reconstruction, must be given immediately.

8. The product must be filtered before intravenous injection.

9. The product should be used with the accompanying intravenous set so that requirements 2, 3, 5, 6 and 8 are complied with.

10. The product should be prepared from pooled plasma, the pool to consist of at least eight to ten individuals.

It is our contention that the kit and contents here described will meet the rigid requirements we have outlined and that these standards must be met by later methods. The original emergency kit will include the following articles. However, two modifications of this set have been devised to meet certain requirements. We believe that type 1 and type 3 kits will be used most frequently. The type 3 kit has been developed to care for those seriously injured patients who require fluid and plasma protein equivalent to 1,000 cc. of whole blood. This set requires a special rig for its manufacture and at the present time there are perhaps not more than three centers in the country that are equipped to handle this type of container. Of course pooling of dried plasma lots would give the quantity, but then transfer contamination again must be considered. The advantages of the type 3 kit are obvious to those conversant with recent trends in blood transfusion work; in the past too small a quantity has been administered in certain conditions such as massive hemorrhage and extensive burns. Reports from plasma centers in England during the last two months support our contentions.

## CONTENTS OF KIT

1. Residue from 250 cc. of liquid plasma. On reconstruction with pyrogen free sterile water this would be equivalent to 250 cc. of "wet" plasma or 500 cc. of whole blood. The dry plasma is contained in a 500 cc. vaccine sleeve type rubber stoppered bottle, and this bottle is hermetically sealed in a snug fitting tin can. Cotton wool is tamped snugly about the base and neck. The tin can measures 3½ inches in diameter and is 8 inches tall.

2. Five hundred cc. of pyrogen free sterile water in a calibrated dispenser bottle. This bottle is fitted with the new type sterile cap which ensures sterility after bottling and prevents contamination during administration. The reason we feel constrained to add the 500 cc. container of sterile water is the incontrovertible fact that water is extremely difficult to sterilize

Circulars of the Reich Minister of the Interior Concerning the Preparation of Blood Plasma for Foodstuffs, *Bull. Hyg., London* 15: 649 (Nov.) 1940.

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Gradwohl, R. B. H.: New Facts on Blood Groups, with Special Reference to Military Purposes, *Mil. Surgeon* 88: 142 (Feb.) 1941.

Kendrick, D. B., Jr.: Prevention and Treatment of Shock in the Combat Zone, *ibid.* 88: 110 (Feb.) 1941.



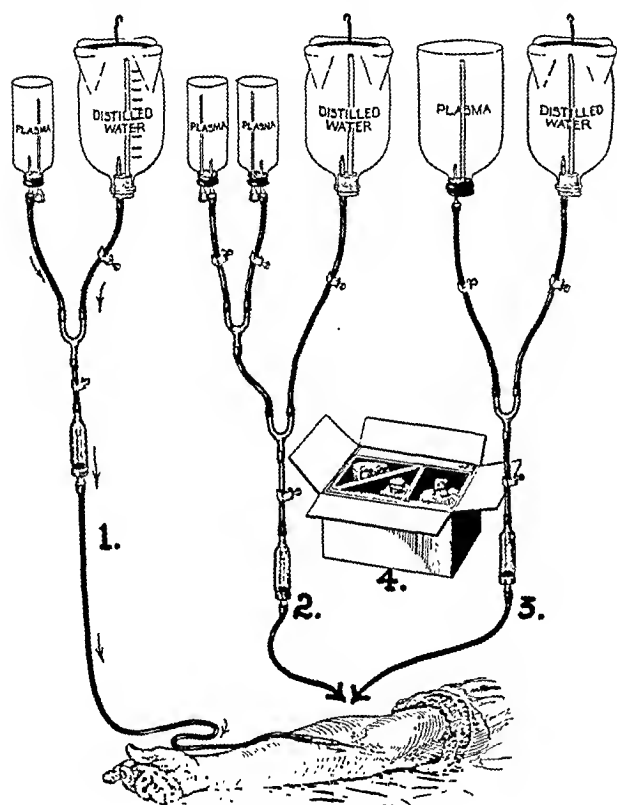
and equally hard to keep sterile. Most reactions to date, as reported by various workers, show that the fault lies in the water used for reconstruction; a pyrogen free sterile water is not the easiest commodity to make.

3. An intravenous needle, size 20; anode rubber tubing of Y design; mechanical filter, and drip chamber; 1 inch number 18 needle attached to the other short arm of the Y tube. This is packed in a sterile manner with the needles being protected by enclosure in a test tube. This segment is united, sterile and ready to use.

4. Four inch number 18 spinal type needle with stylet in sterile test tube.

#### METHOD OF ADMINISTRATION

The corrugated cardboard container is slit open with a knife along the designated line. The contents are removed and, if no table is available, the cardboard box can be up-ended and used for a table. Any improvised stand can be used to suspend



Emergency transfusion kit.

the bottles; on board ship or in a hospital ward these are always available. If no such stand is available because of an exposed position, use can be made of a sapling, a tent stake or even a gun-stock with the bayonet stuck firmly into the ground. The rate of flow can be accurately gaged by the turn-screw petcock, so that the height of the object used to suspend the bottles plays little role except for support. The tin can is carefully opened by the usual type of can opener, but care is needed to make sure the can is opened at the designated end to avoid damage to the glass bottle. On sliding the glass bottle out of the can, one should place a piece of cotton well soaked in either iodine or alcohol on the rubber vaccine stopper of the dried plasma flask to sterilize the rubber cap. The sealing ring of the 500 cc. sterile water bottle should be undone, but the cap itself must not be taken off until everything is in readiness for the transfusion; i. e., after the arm area of the recipient has been cleansed at the cubital site and the tourniquet or sphygmomanometer cuff placed about the arm but not tightened.

When all is in readiness, plunge the number 18 1 inch needle attached to the short arm of the Y tube just through the vaccine stopper into the powder plasma flask, insert the glass nozzle of the other end of the Y tube through the proper designated hole in the rubber cap of the sterile water bottle (after first removing the cover), holding the cover by the edge to prevent contamination of the underlying rubber insert. Insert the number 18 4 inch spinal type needle alongside the needle already piercing the rubber stopper of the dry plasma flask. This needle is to break the vacuum in the bottle during the reconstruction process and administration and is long enough to clear the fluid. Clamp off with the screw-cock the tube running to recipient's needle; up-end the bottle containing the sterile water so that approximately 100 to 150 cc. flows into the bottle containing the dry plasma; gently agitate this bottle to facilitate reconstruction and dissolving of the plasma residue. The dry plasma or serum will dissolve in a few seconds. When the plasma is completely dissolved, up-end both bottles and allow some water from the 500 cc. flask to run through the tubing; get rid of all air bubbles in the tubing by raising and lowering both bottles several times. The anode rubber permits bubbles to be seen. Another method, after the plasma has been dissolved, is to lower the water bottle, lift the reconstructed plasma bottle and allow the plasma to flow into the water container, from which it will flow to the recipient. This method will not, however, allow for varying the concentration. Tighten the arm band on the recipient and insert the sterile needle into the vein; release the tourniquet pressure as soon as the vein is entered. Gage the rate of flow by the visual drip chamber. Reconstructed plasma may be given rapidly, so that 500 cc. will run in within twenty minutes. This is due to the fact that a person who needs fluid and plasma protein badly will absorb it quickly. If the person requires another bottle of reconstructed plasma, repeat the procedure with another type kit but stick the new recipient needle into the rubber tubing (after cleansing with alcohol) which is already set up and running distal to the mechanical filter and drip chamber of the original setup. In this way, fluid and plasma protein representing 1,000 cc. of whole blood can be given quickly, simply and with the full knowledge that the emergency kit will deliver the plasma proteins to the patient in a sterile manner at a time when they will do the most good. (See sketches also for larger quantity transfusion.)

#### CONCLUSION

A new emergency transfusion dry plasma kit has been devised. It will adequately meet conditions imposed on it by modern warfare. It will fill a long standing need in civilian life and practice; smaller hospitals, emergency stations, fire houses, industrial factories, oil refineries and forestry outposts should keep such a kit or kits in their emergency lockers. Armed forces ashore and afloat will require large numbers of these or similar kits. They will enable transfusion therapy to be moved to more advanced positions in actual warfare; smaller vessels will have transfusion facilities for their wounded. Gun flash, explosion and incendiary bomb burns will now be treated in the first critical hours.

The financial cost of these kits is small when the life saving properties are considered. The federal government may find it advisable to produce and dispense such units. Our civilian population must realize that its part in the national preparedness program will be to supply blood voluntarily for national defense needs; this is the least it can do to pay for its protection. Such a widespread program would guarantee a constant and adequate supply of dried blood plasma.

Modern warfare with its terrific toll on civilians and armed forces alike make it mandatory to provide for, to protect and to treat as quickly as possible all persons requiring blood transfusions. The emergency transfusion dry plasma kit will provide a strong therapeutic weapon for our medical services.

Two modifications of the original unit are shown. Each one has its special merits.

## Special Article

### LEGAL RESPONSIBILITY FOR MEDICAL MALPRACTICE

#### V. FURTHER INFORMATION ABOUT DUTY AND DERELICTION

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*This is the fifth of a series of six articles on "Legal Responsibility for Medical Malpractice." The four previous articles were published in The Journal March 8, May 10, May 31 and June 14, respectively.*

In a previous article in this series I proposed a comprehensive formula by which one may judge the legal sufficiency of any malpractice claim. This includes four essential components which must all be present concurrently: duty, dereliction, direct causation and damage. Before a plaintiff can make out a prima facie case of malpractice, he must prove each of the four by sufficient evidence to support fact findings by a reasonable man. If he fails to meet this burden of proof, he is not entitled to go to the jury, but the trial court is duty bound, on timely motion, to instruct a verdict for the defendant.

#### I. DUTY

Now that I have put forward the proposed formula in its simplest form, the reader may profit by a partial unfoldment of the four telescoped concepts. I shall begin with the crucial question of duty. Certain questions in respect to duty should always be asked in appraising each new situation of alleged malpractice. They are:

1. Did a duty arise under the circumstances?
2. Did the scope of duty extend far enough to make the medical conduct complained of a legal dereliction?
3. Had the duty, though once existent, been extinguished before the alleged dereliction occurred?

These inquiries present separate legal questions. If the physician can establish an adverse answer to any one of the three, he will defeat the plaintiff's proof of duty and thus prevent his making out a case of malpractice. These telescoped questions thus stand as main principles in the exploration of duty and, by giving orientation, may protect the reader from bewildering minutiae.

#### 1. DID A DUTY ARISE UNDER THE CIRCUMSTANCES?

To meet this question, which stands at the threshold of every problem of medical malpractice, one must know the possible sources of duty.

*Contract Basis of Duty.*—It was a favorite practice of early English precedents and indeed of many American decisions to seek the origin of duty in contract. True, a physician does not take with him a pad of blank forms in fine print or say to his patient at the other end of the telephone wire: "I'll be over, old man, just as soon as my lawyer can draw up a contract." Nevertheless, modern law has parted company with the old view founded on rules of the English College of Physicians, that a physician's services represent an honorarium and so he cannot sue for fees. Despite lack of formal bargaining, the usual medical engagement is an implied agreement containing the requisites of any binding contract: offer, acceptance and con-

sideration. The undertakings assumed are sufficiently definite and certain, even though implied, and the contract is legally binding if both parties are competent, that is, not under some such disability as minority or insanity. When a patient summons his physician, he impliedly agrees, in the event his offer of employment is accepted, to follow the reasonable instructions his physician lays down and to pay the fair value of the medical services rendered. The physician, in turn, by saying that he will answer the call, accepts this offer of employment and, by way of consideration, impliedly promises to attend with diligence until the case is properly terminated and warrants that he possesses and will apply average knowledge, judgment, care and skill.

*Tort Basis of Duty.*—Even in the early cases, the courts began to make it clear that the physician under such employments had a liability to the patient even if the latter was a stranger to the contract and therefore without standing to sue for its breach. Such, in fact, was the dictum laid down by Lord Coke, chief justice of England, in the pioneer case of *Everard v. Hopkins*, in 1615, (Court of King's Bench, 2 Bulst. 332; 80 E.R. 1164). The case concerned a servant who had been hurt by a cart wheel. His master employed the defendant physician to treat the wound. Coke held that for injury occasioned by negligent treatment the servant was entitled to his separate "action on the case" for damages. The duty owed to the servant in such a case does not arise from contract, for the master and not the servant hired the medical practitioner. It springs rather from the affirmative act of the physician in entering on the physician-patient relationship. This origin of a duty of care toward a perfect stranger is not a novel concept. The law of torts,<sup>1</sup> of which the law of negligence is one branch, does not require a person to act toward a stranger. So long as the choice remains unexecuted, the prospective actor may act or not, as he pleases; he is a so-called volunteer. Though he has no preexisting obligation to act or change the status quo, if he voluntarily assumes to do so he becomes at that very instant subject to a legal duty toward the object of his ministrations, to see that his conduct does not carry an unreasonable risk of harm.

The next step in explaining the patient's immediate rights against his physician was legal recognition that a medical dereliction constitutes a "tort" as well as a breach of contract. Hence, even though the patient himself employed the physician, he might elect to consider mala praxis either as a breach of contract or as a "tort" and make either ground the basis of a legal action. If he adopted one theory of recovery in his pleadings, he was held to that theory and the remedies and rules of law which went with it ("theory of the case" decisions).

More recently, the courts have recognized that the law of torts properly governs the usual case of medical malpractice and that if a plaintiff pleads the contract

1. A "tort" is a wrongful invasion of some right of personality or of property of another, causing injury in respect to which the law will give redress by money damages without proof of any contractual or consensual relations between the actor and the person acted on. Tort law might be characterized as the sum total of those legal prohibitions whereby the sphere of individual existence is protected from negligent, intended or malicious conduct of strangers. "The law of torts" is thus a generic term covering a wide variety of such wrongs, including "assault," "battery," "trespass," "conversion" (wrongful appropriation of another's personal property), "false imprisonment," "malicious prosecution" for a crime not committed, "slander and libel," "negligence," "fraud or deceit," "breach of trust," a stranger's act in "inducing breach of contract," "malpractice" of a professional man, violation of patents, trade-marks, copyrights or other vested property rights, "unfair competition" in business and other such proscribed conduct. It is through this branch of the law that such individual rights have received greatest legal protection and the citizen has been insured against unnecessary risks of injury in a crowded society.

of employment it is generally only to show the source of duty. This can be illustrated with cases.

#### DUTY ARISING FROM CONTRACT

1. No duty rests on a physician to accept an employment. He may refuse arbitrarily to engage his services (*Hurley v. Eddingfield* [Ind. Supreme Court], 1901, 156 Ind. 416, 59 N.E. 1058, 83 Am. S.R. 198; 53 L.R.A. 135).

*Example.*—Hurley, an administrator of Charlotte Burk, deceased, sued Eddingfield for \$10,000 damages for wrongfully causing the death of his intestate. In his complaint the plaintiff alleged that:

At, and for years before decedent's death, Eddingfield was a practicing physician at Mace, in Montgomery County, duly licensed under the laws of Indiana. He held himself out to the public as a general practitioner of medicine. He had been Charlotte Burk's family physician. She became seriously ill and sent for him. The messenger informed Eddingfield of decedent's violent sickness, tendered him his fee for his services, and stated to him that no other physician was procurable in time and that decedent relied upon him for attention. No other physician was procurable in time to be of any use, and decedent did rely on appellee for medical assistance. Without any reason whatever, appellee refused to render aid to decedent. No other patients were requiring appellee's immediate service, and he could have gone to the relief of decedent if he had been willing to do so. Death ensued, without decedent's fault, and wholly from Eddingfield's wrongful act. The alleged wrongful act was appellee's refusal to enter into a contract of employment.

Defendant filed a "demurrer" in the trial court. "Defendant demurs to each and singular of the plaintiff's allegations and says that same are insufficient in law to state any cause of action." The demurrer is a pleading device by which a party, in advance of trial, can test the sufficiency of his opponent's pleadings. Its effect is to say: For purposes of the pleadings but not for trial, all your allegations are admitted to be true, yet they still fail to set forth facts stating any cause of action recognized by law.

The trial court sustained the demurrer and on plaintiff's failure to amend his pleadings entered a judgment dismissing the case. The Supreme Court of Indiana, through Justice Baker, affirmed the judgment, saying:

The act (Medical Practice Act, 1897) is a preventative not a compulsive measure. In obtaining the state's license (permission) to practice medicine, the state does not require, and the licensee does not engage, that he will practice at all or on other terms than he may choose to accept. Counsel's analogies, drawn from the obligations to the public on the part of innkeepers, common carriers and the like, are beside the mark.

This was the rule at common law before the medical practice acts, and it continues to be so today. The rule at first may appear inhumane, but the law prefers trusting the moral sensibilities of the physician to making him subject to dictation and exploitation by the laity. Imagine the intolerable situations which might arise if the patient could say for the physician whether the case lay within his range of interest or qualification or might be handled in the time available. Such a rule would strip the physician of the rightful control of his medical engagements and make him a menial in the hands of the uninformed.

2. When a physician accepts an employment and then fails to enter on it, with no adequate excuse, his liability is for breach of contract rather than in tort.

*Example.*—X agrees to attend Y in childbirth for \$25, to be paid by her husband. Y sends a messenger for X when labor pains begin, but he does not come. He is liable, not in tort for negligent performance of the physician-patient relationship, but for breach of contract in failing to establish that relation as agreed.

#### DUTY ARISING FROM TORT PRINCIPLES

Voluntary undertakings gratuitously assumed raise a duty of medical care in respect to the patient.

1. Duty in respect to "good Samaritan" cases arises only in event the physician elects to proffer medical aid.

*Example.*—Physician X is passing along a lonely road when he sees the victim of a collision lying sorely wounded by the way. He fails to stop and render aid, which would have prevented a subsequent complication. The injured man files suit against him for professional negligence. X is entitled to an instructed verdict, for he owed no duty to act.

An omission to act cannot constitute negligence, and thus a tort, unless there was some prior duty resting on defendant to act in protection of the other's interests. In cases of the character described, the law places no duty on the stranger to render aid; it is an obligation which is left to the moral judgment of the passer-by.

2. Duty arises when one assumes to treat a gratuitous or charity patient.

*Example.*—Physician X is a physician in the outpatient department of a city hospital. In treating Y, he negligently inflicts an injury, for which Y sues. X defends on two grounds: (1) that he was acting in the premises only as an employee of the hospital, which, being a municipal institution, is exempt from suit except by its consent and (2) that Y cannot exact a duty of care from the physician such as the law implies in case of employments for gain but receives the gratuitous treatment burdened with any risks of injury.

Neither of these defenses is good. As to the first, the immunity to suit which a municipality enjoys does not extend to its servants, who remain personally responsible in law for their individual torts, even though committed in the scope of their employment. The second contention fails because though a physician may decline to treat a patient gratuitously, if he elects to do so the voluntary assumption of the undertaking raises a duty, under the law of torts, to execute the matter with due care and skill. It is the law that such duty of care is the same as that owed to a paying patient. The relationship may differ in respect to the mode of termination and in the wider latitude in delegating phases of the medical care.

3. On principle, the duty of a physician who assumes to act in a "good Samaritan" case is analogous to that arising from the treatment of gratuitous patients.

*Example.*—Physician X stops by the side of a busy road to help an injured man, who is unconscious. He tells the surrounding crowd that he is a physician and will take charge. In rendering first aid, he negligently compounds a simple fracture and introduces infection. On proper proof, he is liable, the case being like that of the voluntary treatment of a charity patient. It can be argued that in "good Samaritan" cases the physician should be held to no higher duty of care than a layman, especially when the injured person is unconscious and so cannot be relying on the professional status of the actor. In the case stated, X is assuming charge of the situation as a physician and causes the onlookers to relax diligence in getting the injured man into another physician's hands. Even if the usual rule is applied, that a volunteer's duty in a "good Samaritan" case is only to see that his action does not leave the injured man in a worse condition than when he found him, this very thing has occurred if he displaces available, competent medical care with negligent treatment.

Thus a different result might obtain if the injured man were found on a forsaken mountain road where, if unattended shortly, he would have died from freezing. In this case it can hardly be argued that the physician, by assuming control and applying negligent treatment, has displaced the injured man's likely prospect of competent care. Rather than displacing able medical attention by negligent care to the patient's detriment, the actor has substituted a compound fracture for death. Thus, I believe the proper rule in "good Samaritan" cases is that the physician who assumes to act will be held to the standard of care exacted from physicians. Yet, though he is under a higher duty than a layman and he breaches this duty by committing a negligent act, he may be immune from more than nominal liability in many instances because of failure to prove "damage" (one of the essential four D's of the formula: duty, dereliction, direct causation and damage). In those instances the net effect of his intervention has been to leave the patient in a better or safer position

that Y's parents have a cause of action against X on the ground that the statute raises a duty intended to ensure protection to not only the public generally but to those members of it specifically affected by its breach. The sources of duty are summed up and analyzed in table 1.

One can see that once the physician-patient relationship arises in fact, by actual entry on it, certain minimum duties attach by law. They are the same whether one traces them to an implied warranty in the contract of employment or to the duty of care which the law of torts impresses on the "volunteer" to see that his affirmative conduct does not carry unreasonable risk of harm to those who might be injured by negligent performance. The tort theory is a more fundamental basis than contract for explaining this "relational" duty, since it accounts for the duty owed in treating a patient who is unconscious or of unsound mind and therefore incapable of "consent," for the duty owed the patient who is a stranger to the contract of employ-

TABLE 1.—Sources of Duty

		Actual Entry on Physician-Patient Relationship	
I. Antecedent Duty to Act			
1. Contract, expressed or implied	Raises contract duty to establish physician-patient relationship. If physician fails or refuses to establish the relationship, plaintiff may sue for breach of contract	Duty to establish physician-patient relationship	(x) Assumption to act makes source or existence of prior duty immaterial; duty of care and skill arises under law of torts from the affirmative action toward the patient; questions of malpractice in performance present tort problems (Duty arises) Same result as (x)
2. Duty cast by statute or ordinance	If physician fails or refuses to establish the relationship, he probably breaches a duty extending by statutory intent to the injured plaintiff and is responsible civilly in tort for damages arising from his failure to act	Duty to establish physician-patient relationship	
II. No Antecedent Duty to Act			
1. Physician declines, even arbitrarily, to engage his services		No duty to establish physician-patient relationship	(Duty arises) Same result as (x)
2. Petition of gratuitous patient for treatment		Response of physician lies within his discretion	
3. Appeal of injured person by wayside ("good samaritan" ensues)			
III. Conclusions			
1. Failure to act can constitute negligence or a medical dereliction only when some preexisting duty to act is owed to the prospective patient			
2. Irrespective of any preexisting duty, once medical care is undertaken the law raises a uniform duty of care and skill in favor of the patient			

than when he found him. There is undoubted negligence (or dereliction) in the insufficient performance of the voluntarily assumed action, but in showing what his position would have been in absence of the defendant's intervention, in seeking to prove damages, the plaintiff's evidence would disclose that his life at the time of the gratuitous act had but minutes or hours to run. I do not want the physician to believe that he assumes a heavy risk when he helps such a person in distress. Practically, the risk is almost nonexistent; the patient in such circumstances is not apt to press a claim against his benefactor, and juries are apt to be still slower to return fact findings of negligence. Yet, such situations may occasionally arise, and their legal bearings have an inescapable intrinsic interest.

DUTIES CAST BY STATUTE OR ORDINANCE

X is a public health officer charged by statute with the duty of examining persons suspected of having contagious disease, preliminary to isolating them in appropriate city hospitals. A general practitioner reports Y as such a suspected person. X omits to examine and isolate Y, and as a result, Y's eight brothers and sisters contract diphtheria. It is likely

ment, for the duty which arises in treating the gratuitous or charity patient, who gives no consideration for a contract, and lastly, for the obligation of care and skill in "good Samaritan" cases, in which the physician bestows medical attention without prior legal duty or contractual relationship.

Where, then, is the contract of employment of any legal importance? the physician may ask. Briefly, it is most significant as an instrumentality by which physician and patient may regulate their relationship in directions not forbidden by law.

1. The contract of employment secures to the physician legal rights of compensation: (1) If the contract is implied, the patient is held to pay the reasonable value of the services rendered. (2) By valid express agreement (certain in terms, between competent parties and not procured by fraud, coercion or undue influence), the compensation to be paid may be fixed at any figure the parties agree on, without reference to reasonableness.

2. The contract casts a duty on both parties to establish the physician-patient relationship at a future date. A patient can thus secure in advance of treatment the assurance of care by a man whose services are in

extreme demand, such as a specialist in respect to a delicate operation. Dependable engagements contracted in advance enable the physician to arrange his schedule with more certainty.

3. The contract affords a means of adding to, and perhaps subtracting from, the requirements of knowledge, judgment, care and skill otherwise fixed by the law of torts. Normally, these are fixed by reference to the quantum possessed and exercised by the average practitioner in the same community, and it is the duty of the physician to bring this standard of attainment and performance to the case at hand.

If my view is sound, the law of torts, which imposes this duty, in effect says: The law is interested only in assuring to the patient "average attention." If the parties, by express agreement, wish to assume super-added duties, well and good, but failure to perform these *extraordinary* obligations or their imperfect execution is a mere breach of contract; it is not also a tort unless the dereliction involved infringes as well the lesser duty of "average" care imposed by the law of torts.

4. If a contract exists, it may well be that the patient has bargained for the personal skill of the particular physician in the performance of various functions. Under the law of contracts, such personal duties are nondelegable except by the express consent of the affected party.

5. A relationship arising by contract may require different means for its rightful termination.

6. Whether the patient's rights depend on a breach of contract or on a tort is not a scholastic quibble or immaterial question of procedure. Some practical consequences hang on the answer, and these are worthy of consideration.

(1) Under "wrongful death statutes" the cause of action against the physician survives the death of the patient if it springs from a tort but not if it depends on mere breach of contract. At common law, when a person was injured by the wrongful act of another but died before an action could be brought or tried, his claim was thereby extinguished. In brief, there was no liability at common law for negligence which resulted in the death of the injured person. This rule was changed in England by Lord Campbell's act (the Fatal Accidents Act, 1846, 9 and 10 Vict. c. 93), which in effect provided that the claim for wrongful death should not be extinguished by the premature demise of the injured person, but should be preserved to his legal representatives.<sup>2</sup> Most American states have passed "wrongful death statutes," using the same or

similar language, to carry out in this country what was recognized as an exemplary reform.

The decisions hold that if a complaint in respect to alleged malpractice shows only a breach of contract, it will not support an action for the patient's death brought against the physician under the "wrongful death statute"; if it shows a tort, the action is preserved within the intent of the statute. In the first case the aggrieved party is confined to a mere action for breach of contract which survives to legal representatives under independent doctrines of law.<sup>3</sup> So, again, one finds it a pragmatic inquiry to ask: was the "wrong" merely a failure to establish the actual relationship of physician and patient as promised in the contract of employment (breach of contract), or was the wrong a dereliction occurring after actual initiation of treatment (and hence a tort)?

(2) If the injured patient in his claim of medical dereliction can show only a breach of contract, the jury cannot assess punitive damages; if he can show a tort extreme enough to constitute gross negligence, the injured patient is entitled to have the jury assess punitive or exemplary damages.

*Example.*—Y, being near full term, has her husband engage the services of X, an obstetrician, to conduct the labor for a stipulated fee of \$25. Pains having set in, Y sends for X. Without adequate excuse, X fails to come, by reason of which Y suffers preventable pain and injury. Y can recover actual but not "punitive" damages. American law permits a jury to award the latter by way of example or punishment when the medical conduct is grossly negligent, wanton or reckless. Such damages are not allowed in respect to mere breach of contract, however unwarranted the refusal to perform. The case stated is one of breach of contract to establish the physician-patient relationship, not one of malpractice (tort) under the relationship.<sup>4</sup>

*Example.* — Y, needing dentures, consults X, a licensed dentist, to have his teeth removed and plates prepared. Under X's supervision and instructions, B, a person without adequate knowledge, skill or experience and without a license, commits gross negligence in extracting a part of the jaw bone under the supposition that he is removing a root. The fracture of the jaw bone is a tort, and Y may recover punitive, as well as actual, damages from X (*Mandeville v. Courtwright* [U. S. C. C. A. Pa.] 1905, 142 Fed. 97, 73 C. C. A. 321, 6 L. R. A. [N. S.] 1003).

If my analysis of the source of duty is applied, one sees that these 2 cases are reconcilable. Though in the second case a contract of employment exists, the entering on the physician-patient relationship has also occurred, giving rise to duties of care sounding in tort. The breach of these duties constitutes a tort, in this case amounting to that gross negligence on which "punitive" damages may be assessed, and the patient does not need to go back to the contract of employment for the source of her rights.

(3) There may be questions as to which statute of limitations shall apply. Early in the history of the common law, it was found that persons with weak or doubtful claims often waited to assert them until the prospective defendant had lost the evidence for his defense by lapse of time or through the death of valu-

2. This act has been further broadened by subsequent amendment: Fatal Accidents Act, 1864, and Fatal Accidents Act, 1908.

1. "When death is caused by negligence, an action shall be maintainable. Whosoever the death of a person shall be caused by wrongful act, neglect, or default, and the act, neglect, or default is such as would (if death had not ensued) have entitled the party injured to maintain an action and recover damages in respect thereof, then and in every such case the person who would have been liable if death had not ensued shall be liable to an action for damages, notwithstanding the death of the person injured, and although the death shall have been caused under such circumstances as amount in law to felony."

2. Action is to be for the benefit of certain relations and to be brought by the executor or the administrator of deceased. "Every such action shall be for the benefit of the wife, husband, parent, and child of the person whose death shall have been so caused, and shall be brought by and in the name of the executor or administrator of the person deceased; and in every such action the jury may give such damages as they may think proportioned to the injury resulting from such death to the parties respectively for whom and for whose benefit such action shall be brought; and the amount so recovered, after deducting the costs not recovered from the defendant, shall be divided amongst the before-mentioned parties in such shares as the jury by their verdict shall find and direct."

3. Action is to be commenced within a year, provided always, that not more than one action shall be for and in respect of the same subject matter of complaint and that every such action shall be commenced within twelve calendar months after the death of such deceased person.

3. *Braun v. Riel* (Missouri Supreme Court) 1931, 40 S. W. (2d) 621, 80 A. L. R. 875; *Thaggard v. Vafes* (1928) 218 Ala. 609, 119 So. 647.

4. *Hood v. Moffett* (Mississippi Supreme Court) 1915, 109 Miss. 757, 69 So. 664, Ann. Cas. 1917 E, 410.



able witnesses. To remedy this, statutes of limitation were passed,<sup>5</sup> which provided in effect that various grievances must be sued on within a certain time after the cause of action accrued or be forever barred.

This intended purpose to bar stale, and often fraudulent claims and to exact diligence from an aggrieved party has been embodied in the statutes of limitations of the several states. The statutes covering breach of contract give to the injured party a much longer time for filing suit than do those covering tort actions. For contracts, the period usually varies from two to six years, depending on whether the contract is oral (shorter) or written and on the particular state; for torts, the period of limitation varies from one to two years after accrual of the cause of action.

*Example.*—X, a surgeon, under a contract of employment, operates on Y. Three years later Y sues X for malpractice in negligently leaving a sponge within the wound, a fact discovered six months after the operation. X, by way of defense, pleads that the suit was filed more than two years after the cause of action accrued and so is barred by the statute of limitations. Y maintains that he had the operation under a contract of employment and that consequently his action against the surgeon is for breach of contract, is governed by the four year statute of limitations and is therefore filed in due time.

The courts of most jurisdictions have held that the injury is a tort despite the existence of a contract and so is governed by the shorter period of limitations. This doctrine is favorable to physicians and works to their advantage in defense of malpractice actions.

## 2. ASSUMING THE DUTY TO THE PATIENT WHICH THE LAW IMPLIES, WHAT IS ITS SCOPE AND MODE OF MEASUREMENT?

On this vital subject, again I shall put the goal of orientation before the ideal of definitive treatment. Many of the principles to be mentioned afford focal points for radiation into extremely important medico-legal problems.

### 1. NATURE AND SCOPE OF THE DUTY OWED

A physician is required to possess and apply to the conduct of the case such knowledge, judgment, care and skill, in respect to both diagnosis and treatment, as the average physician in the same or similar communities and in the same line of practice would use under like circumstances in light of the existing state of the science.

*Failure to Apply Professional Equipment as Common Denominator of Malpractice.*—It is the failure to apply this professional equipment which is the vital concern of the law, whatever is the cause of the deficient performance—negligence, intentional disregard or deficient knowledge or skill. Failure to apply the required professional qualities is the common denominator of all malpractice cases.

*Misfeasance and Nonfeasance.*—A dereliction constituting negligence may consist of an affirmative act ("misfeasance"), or it may consist of an omission to act when good practice would require action ("nonfeasance").

*Performance to Meet Standard of "Average Physician."*—The law takes as its standard the "average physician"; it does not hold the practitioner to the endow-

ments of genius or even to the standards of the superior practitioner. It does not require him to "do his best," for this is a subjective standard, and though put forward as a test by one or two early cases, it has been abandoned in the later decisions. Such a test would be a cloak for the earnest ignoramus or the sincere person devoid of skill, while making the surpassingly good man liable for performances short of his best, though they were superior to the peak performances of his fellows. The law clings to an objective standard. It also relishes the idea of leaving a margin of initiative to the enterprising, represented by the difference between their personal standards and the much lower "average" standard below which the law first attaches liability.<sup>6</sup>

*Standard Fixed by Expert Testimony as to Local Practice.*—The standard of acceptable medical practice is established by expert testimony as to the local practice. The physician in a small town or rural community is judged by the level of attainment of his fellows; this is regarded as fair on the ground that they have had like opportunity for experience. Evidence is not admissible to show that his conduct would be considered negligent according to the practice of the "Mayo Clinic" or of other large medical centers.

On the other hand, should he be enterprising enough to apply some proved method newly established by such a center, will the court forbid his bringing in an authoritative expert witness from afar, on the ground that such a physician cannot be familiar with the level of local practice? Some writers on law have implied that such might be the case. This contention I believe to be a mistaken one. Its effect would be to turn against a malpractice defendant a rule invented for his protection. I think the law would permit him to prove by such authorities the propriety of the treatment used, particularly when the question is purely: What is good medicine? He would thus be enabled to counter adverse testimony of less progressive local practitioners who from one motive or another might dislike his innovations. I have not found a specific case dealing with this precise point, but the logic is too strong for the law to deny. Society is interested in having practitioners in remote places adopt proved advances, and a contrary rule would work an undeserved hardship on a progressive physician who chanced to settle among quacks or timid innovators. The true rule probably is that expert testimony cannot be imported from larger centers to charge the defendant physician with a higher duty of care than is current in his own or similar communities, but it can be brought to his aid to rebut a charge that he has acted rashly in his choice of treatment or procedures.

*Standard Fixed by Reference to Practitioner's Own Class.*—A further illustration of the notion of judging like by like is the rule that a general practitioner's performance is to be judged by the attainment level of the general practitioner, and probably the performance of an intern is to be judged by that of the "average" intern. This "class" system in respect to the standard of care which is applicable is of great importance to young medical graduates. If they leap directly into

6. An interesting consequence follows from the fact that the duty imposed springs from the law of torts and is uniform as to all members of a particular class of practitioners. This is the ruling that self aggrandizement does not increase the duty of care. Thus, in *Schirson v. Walsh* (Illinois Supreme Court) 1934, 354 Ill. 40, 187 N. E. 921, it was held that a physician who proclaimed himself one of the greatest and most skillful plastic surgeons in the world did not thereby become subject to a higher requirement of skill and ability than is expected of the average physician in determining the question of malpractice.

5. Statute 21 Jac. 1, c. 16, 1623.

practice, they assume at once the full duty of the practicing physician; if they become interns, they have a lesser duty while acquiring the "average" skill which only experience can supply. Specialists are judged by average practice of fellow specialists. This is held to be just because the specialist holds himself out as having superior equipment in his limited field, and he charges a correspondingly higher fee to the patient.<sup>7</sup>

An interesting case could arise as follows: Suppose a physician who specializes in the treatment of fractures is going along a road when he sees an unconscious man who has been sorely injured in a collision. He stops to give aid but does not simply splint the limb. He sets the fracture in a way which would be "due care" if done by a general practitioner but is negligent according to the standard of specialists. The unconscious man could not be submitting to treatment in reliance on the supposed superiority of the specialist. It is submitted, therefore, that X would not be liable in an action for malpractice. Such a principle might well be of considerable moment when a specialist acts in a nonconsensual transaction of the character described. If this view is accepted by the courts, they should likewise hold that the specialist can recover only what would be fair compensation to a general practitioner for the service rendered.

Suppose, instead, that X has the injured man, Y, sent to his clinic. On regaining consciousness, Y continues to accept the services of X in reliance on information that he is in the hands of a specialist. The duty of care and the scale of compensation at once revert to the higher level of the specialist.

*In Respect to Treatment but Not in Respect to Diagnosis, Practitioner Judged by Principles of His Own "School of Medicine."*—The duty of the physician is only to treat according to the principles of his "school of medicine." It is the view of American courts that a patient cannot expect the advocate of one system of medicine to apply the precepts of another. The "school of medicine" doctrine does not, either in reason or under the prevailing legal view, extend to diagnosis. Identification of the illness presents a common scientific question which all schools must answer if their varying treatment is to be directed toward an actual, as opposed to an imaginary, malady.

*Duty of Care Is Proportioned to Time, Place and Circumstances.*—The duty of care is proportioned to the time, the place and the circumstances. The emergency amputation of a gangrenous leg on a kitchen

table under a kerosene light might represent the highest degree of due care in a backwoods cabin, but if primitive conditions were used in a modern hospital the case would get to the jury on a charge of negligence.

Thus, regard must always be had to the particular emergencies under which the physician acts, the instrumentalities at hand and the alternative courses he has available.

*Treatment Must Conform to the Modern State of the Science.*—Some physicians believe, but quite erroneously, that any treatment is permissible which once has had the approval of medical science. Such is not the case. The law does not proscribe what is old; if some measure used by Hippocrates is still good medicine, it may be used with impunity. But a duty lies on the physician to conform his practice to the "modern state of the science." He may, therefore, be negligent in using an obsolete method no longer employed by the average practitioner. He might cite the court by book, page and verse authoritative statements from the middle ages that one may judge a specimen of urine by looking at it, but visual examination would not be taken in lieu of a Benedict test for sugar. Physicians are therefore under a legal duty to keep apprised of major developments and abandoned doctrines—a stricture which may console medical students.

*Physician Is Entitled to Choose Among Currently Sanctioned Methods of Treatment, Without Liability for Failure to Use the Method of Choice.*—In respect to the choice of treatment, it is the law that a physician cannot be held negligent for using a less desirable treatment than the one of choice if both have current medical sanction. Testimony of other physicians that they would have done otherwise is therefore not enough to make out negligence; they must be willing to say that what defendant did or failed to do was improper in the light of average practice. The right of the physician to choose between alternative methods is jealously guarded by the law.

## 2. "ERROR OF JUDGMENT" AS A DEFENSE TO ALLEGED MALPRACTICE

Further confusion has existed in respect to so-called "error of judgment" as a perfect defense to an action of malpractice. It is indeed true that the law does have a high regard for the untrammelled exercise of professional judgment. This it looks on as one of the most important prerogatives of the professional status. Nevertheless, the law will not permit the doctrine of "error of judgment" to be misused as a cloak for professional dereliction.<sup>8</sup>

For example, suppose a physician comes into the room of his patient, sniffs a few times and, without laying a hand on him, enters a mistaken diagnosis. Suppose further that percussion, inspection of signs and taking a clinical history would have led him right. In such case it is no answer to a charge of negligent diagnosis for him simply to say that he made an "error of judgment." Yet, in its proper scope, the doctrine of error of judgment is important. Originally invented

7. The basis of the rule is stated clearly in *Baker v. Hancock* (1902), 29 Ind. App. 456, 63 N. E. 323, 64 N. E. 38. "It is averred in two paragraphs of the complaint that the appellee 'was making a specialty of the treatment of cancer, and held himself out to the public as a specialist of said disease of cancer, by advertising in the public press, and by other public notices thereof.' A specialist, as the term is here used, is understood to mean a physician or surgeon who applies himself to the study and practice of some particular branch of his profession. Scientific investigation and research have been extended and prosecuted so persistently and learnedly that the person affected by many forms of disease is of necessity compelled to seek the aid of a specialist in order to secure the results thereof. The local doctor in many instances himself suggests and selects the specialist whose learning and industry have given him a knowledge in the particular line which the general practitioner, in rural communities especially, has neither time nor opportunity to acquire. . . . Being employed because of his peculiar learning and skill in the specialty practised by him, it follows that his duty to the patient cannot be measured by the average skill of general practitioners. If he possessed no greater skill in the line of his specialty than the average physician, there would be no reason for his employment; possessing such additional skill, it becomes his duty to give his patient the benefit of it. The appellee, if he held himself out as a specialist in the treatment of cancer, was bound to bring to the discharge of his duty to patients employing him, as such specialist, that degree of skill and knowledge which is ordinarily possessed by physicians who devote special attention and study to a disease, its diagnosis, and treatment, having regard to the present state of scientific knowledge. . . . This is the degree of skill which, by holding himself out as a specialist, he represented himself to have; and it does not lie with him to assert, after securing employment and compensation on that basis, that his representation was not true."

8. In *Schumacher v. Murray Hospital*, 1920, 58 Mont. 447, 193 Pac. 397, the Supreme Court of Montana quoted with approval this passage from *West v. Martin* (Supreme Court of Missouri), 1861, 31 Mo. 375, 80 Am. Dec. 107: "whether errors of judgment will or will not make a surgeon liable in a given case depends not merely upon the fact that he may be ordinarily skillful as such, but whether he has treated the case skillfully or has exercised in its treatment such reasonable skill and diligence as is ordinarily exercised in his profession. For there may be responsibility where there is no neglect; if the error of judgment be so gross as to be inconsistent with the use of that degree of skill that it is the duty of every surgeon to bring to the treatment of the case according to the standard indicated."

to protect the surgeon or physician, who at times must act almost instantly in emergencies without prior leisurely investigation of all the material facts, it still finds its chief application to those situations.<sup>9</sup>

When time and opportunity exist, the law requires the physician to employ his fact-finding powers, in accordance with "average" practice, before he exercises his judgment. Scientific tradition dictates that medical decisions must be grounded on objective facts when ascertainable. It is an enlightened judgment which is wanted. If the physician has thus previously gathered his facts with due diligence and they are susceptible (per "average" standards) of more than one interpretation, he is not negligent if he falls into error in adopting one of the possible interpretations. If the facts are 2 and 2, the answer can only be 4, and he is negligent if he finds otherwise; but if the facts are 2 plus 2 or 3, this second digit being blurred to the "average" practitioner even after due investigation, he is not negligent if he finds the answer to be either 4 or 5. The "error of judgment" doctrine, therefore, protects the untrammelled exercise of judgment against charges of negligence in certain cases, even when it results in mistaken conclusions, as for instance when:

1. A surgeon acts in an emergency, as in the foregoing example, and the action he takes on the supposed necessities is not of itself negligently performed. In this case it is the judgment of the physician as to *what* the facts are that is protected, and he is safe if he conforms his treatment thereto and applies it with due care and skill.

2. A physician satisfies his fact-finding obligations and applies average judgment to the interpretation of equivocal facts, or he applies average judgment in choosing among possible diagnoses or conclusions to which *unequivocal* fact findings may point.

In the latter case, the situation, after investigation with due care, may be found to be:

(1) The facts are A, B, C and (D? or E?). He may be forced to decide, by using "average" judgment, whether the fourth fact is D or E.

(2) The facts are unequivocally A, B, C and D. They raise diagnostic possibilities E and F. He may be forced to decide, by using "average" judgment, whether the facts really point to E or to F.

(3) In treating a known condition he adopts of several currently sanctioned methods of treatment that preferred by the minority.

### 3. PHYSICIAN NOT A GUARANTOR EITHER OF DIAGNOSIS OR OF TREATMENT

A physician is not a guarantor either of his diagnosis or of his treatment, and the required negligence necessary for his liability is not made out by mere evidence of results of treatment or a failure to cure or a disappointing result.

### 4. PROOF OF "PRIMA FACIE" CASE OF MALPRACTICE

To make out a "prima facie" case of malpractice against the physician, a patient must prove the four D's—duty, dereliction, direct causation and damage—by a preponderance of the evidence, and when any of these elements depends on expert testimony lay evidence will not suffice. The competency of the witness as an expert is to be determined by the court on

"voir dire" or qualifying examination before he is allowed to testify. The court should be exacting in this respect. Qualifications of a practitioner to speak on technical phases of a specialty foreign to his own knowledge and experience should be scrutinized more closely than in the past. Mere possession of the degree of Doctor of Medicine should not qualify automatically in all instances.

### 5. PHYSICIAN RESPONSIBLE FOR DERELICTIONS OF SERVANT

A physician is responsible for the conduct of an agent or an employee who acts under his immediate supervision or control and is thus his "servant" in legal parlance. Generally speaking, responsibility follows control or joint control of the medical transaction. Such responsibility may attach to a physician who has relinquished control but in the exercise of due care should have retained it, as when a skilled operator in the middle of a delicate operation without imperative cause turns over the completion of a task to one whose inadequacy should have been recognized.

*Examples.*—1. A dentist, X, orders a "servant" to remove a supposed root. In fact, it is a part of the jaw bone, and the "servant" fractures the jaw. X is liable. It was his duty to maintain control. Such cases arise when a physician whose personal skill has been bargained for delegates vital functions of the medical management to others without the patient's consent. Such a delegation makes the physician as liable in tort for the dereliction of his substitute as though he were performing the malpractice. Even if no tort is committed, the unauthorized delegation of a personal duty is a breach of the contract of employment, giving the patient a right to terminate it and to refuse payment. In the case related above, the dentist is liable, as "master," for the negligence of his "servant" committed in the course of employment. But he would also be liable, though out of control, if without the patient's consent he relinquished a nondelegable function to an independent person who performed the task negligently. Such would be the case, for instance, if he called a fellow practitioner from an adjoining office to give assistance in respect to a patient under anesthesia, and so unable to consent, and the physician called in was negligent.

2. X, the head of a roentgenologic department, is sued by Y for the negligence of Z in burning him by over-exposure. This function Z, carried out as an independent employee of the hospital, without any immediate control or supervision by X. Y is the "servant" not of X but of the hospital. His conduct cannot be imputed to X. X is not liable.<sup>10</sup>

3. Suppose the case is the same as the preceding one, except that X and Z are partners in business for themselves. X is jointly liable for a tort committed in prosecution of the partnership business even though he had no part in it.

Possible liability as a joint collaborator must be remembered. When physicians acting together commit a tort, each can be held responsible for the entire result. When two physicians are hired jointly as collaborators, in the absence of contrary instructions they have a right to effect a reasonable division of labor by dividing the functions to be performed. In such case, physician X needs to protest only such negligent performances of functions assumed by Y as occur in his

9. *Stoloch v. Holm* (Minnesota Supreme Court) 1907, 100 Minn. 276, 111 N. W. 264, 9 L. R. A. (N. S.) 712, and *Luka v. Loezic* (Michigan Supreme Court) 1912, 171 Mich. 122, 136 N. W. 1106, 41 L. R. A. (N. S.) 290.

10. *Withington v. Jennings* (Supreme Judicial Court of Massachusetts) 1925, 149 N. E. 201, 253 Mass. 484.

presence. He is under no responsibility in respect to negligent performance of his collaborator which he neither actually sees nor should have seen.

4. With patient B's consent, X chooses a substitute, Y, to act for him during his vacation. Y is negligent, and B sues X. X is not liable if he exercised due care in selecting one he reasonably thought to be competent. He had no control or supervision over Y, and Y must therefore be considered an "independent contractor."<sup>11</sup> (An independent contractor is one who performs an assigned piece of work by his own means, methods and judgment, free of the supervision and control of another, and usually under a contract for an "end result." In contrast, a servant works at the hours and times his employer specifies and receives a wage rather than a contract price, and his physical conduct in the performance of his duties is subject to the direct, and often minute, supervision and control of the master.)

5. X, a general practitioner, is consulted by patient Y. Certain laboratory work is needed which Y reasonably supposes X can do. As a matter of fact, X is familiar with the technics involved, but not having sufficient apparatus he farms the work out to Z, an independent professional technician. Z negligently arrives at erroneous conclusions, as a result of which X applies contraindicated, injurious treatment. Y sues X, claiming that he committed a breach of contract by delegating the work to Z without her consent. She also contends that X is responsible in tort for the negligence of Z. In respect to the first contention, the question is whether the work fell within the sphere of the special skill which Y could suppose she was getting in hiring X. If so, he could not delegate away this personal duty to an independent contractor without his employer's consent. To do so would constitute a breach of contract affording good cause for its termination. But if, as in this case, the work stood on the footing of routine work of simple character not calling for special skill, X could rightfully delegate the work to Z without first procuring the patient's consent. Once it is conceded that the work can be rightfully delegated under the contract without express authorization, X cannot be held liable for any negligence of Z in its performance, for Z is acting in the premises as an independent contractor. In each case of this type the crucial question is whether the patient had bargained for and reasonably expected X to do the work even though the test was a conventional procedure.

Assume that in respect to some extraordinary and usually nondelegable function, special laboratory work calls for apparatus which the physician does not have, and he suggests the employment of Z. In such event, while acting with the consent of his employer to the proposed delegation, he is liable only if he is negligent in selecting Z as an independent contractor at the outset. This depends on whether X knew or should have known, in the exercise of due care, of Z's incompetency. Otherwise, he is not liable for Z's negligence. Y should sue Z. The latter rule would apply to delegation by a private practitioner of work which the patient must realize calls for elaborate equipment the physician does not have, as when another person is called in to make roentgenograms or electrocardiograms with portable apparatus. It was held, on the other hand, in *Jenkins v. Charleston General Hospital* (West Virginia Supreme Court of Appeals) 1922, 90 W. Va. 230, 110

S. E. 560, that a patient of a hospital could rightfully suppose that the institution was equipped to diagnose his disorder and treat him as he had been led to expect. Hence, the negligence of an independent x-ray technician to whom the making of roentgenograms was delegated in failing to take the adequate views of plaintiff's arm necessary to a correct diagnosis, must be referred back to the hospital on master-servant principles. The hospital was held liable, but it must be pointed out that there is a split of authority as to whether the operator of x-ray apparatus is a "servant" or an "independent contractor."

Through an abundance of caution, the physician should always procure consent of the patient, in advance, to the proposed delegation of any significant function.

Of course, X is responsible for the negligence of his own technician, for she is his "servant," and a master must answer in law for the torts of a servant committed in the course of employment. The claim of a master that he hired the servant to be careful not careless and that any negligent conduct therefore falls outside the scope of employment is not a legally effectual contention.

6. It seems that on legal principle when a private physician assumes the care of a gratuitous patient he can no more delegate unique aspects of his professional care without consent in advance than in the case of the paying patient. Thus, in the absence of crucial emergency to substitute another for himself in the performance of an operation after such a patient is anesthetized and so without his consent would constitute a tort. The right to pass the patient from hand to hand may arise from implied consent when the patient can reasonably be bound to knowledge of such a custom, as in attending outpatient departments or large hospitals. Under such circumstances the physician may delegate any part of the care of the patient to colleagues without prior consent, subject only to the requirement that he use due care in selecting a competent person.

#### 6. DUTY IS OF CONTINUING CHARACTER

The physician has a duty to make periodic examinations as needed, to give proper instructions to the patient, to attend him as often as good ("average") practice requires and to cease his attentions only when they no longer appear to be reasonably necessary or when the physician-patient relationship has been properly terminated by mutual consent, at the instance of the patient without prior notice or by the physician after reasonable notice in advance.

#### 7. CONSENT OF PATIENT IS NECESSARY TO "TOUCHING" OF HIS PERSON AND BROAD CONSENT IS DESIRABLE FOR SURGICAL OPERATIONS

The physician owes a duty to obtain consent, express or implied, for any touching of the patient, either by way of physical examination, punctures of the skin, injections or operations. Implied consent may protect against a claimed battery, as for instance an allegedly unauthorized operation, but it is a dangerous and slippery justification. A surgeon should operate only on written consent authorizing such surgical procedures, operations and medical measures, to be applied by the surgeon in charge, his assistants or duly qualified substitutes, as in the judgment of said surgeon or qualified assistants or substitutes seem proper after the specified operation is begun. This should be signed by the patient or, if he is a minor, by the parent or legal

11. Accord: *Myers v. Holborn* (1895), 58 New Jersey Law (25 Vroom) 193, 33 Atl. 189, 30 L. R. A. 345, 55 Am. St. Rep. 606; *Hitchcock v. Burgett* (Mich. Sup. Ct.), 1878, 38 Mich. 501.

guardian. In emergencies, if express consent cannot be obtained readily and the patient's life is threatened by delay, the law empowers the surgeon, under a doctrine of "implied consent," to operate as necessary. Note that this warrant does not extend to collateral and unnecessary operations.

#### 8. DUTY OF DISCLOSURE

On occasions, the physician comes under a duty of disclosure, as discussed earlier in this paper. In the past, insufficient attention has been given to the prophylactic usages of disclosure and consent. Whenever a physician is in doubt as to whether a proposed action or persistence in a long-continued regimen is for the patient's best interests, he should take inventory of his medicolegal position. He should seriously consider, as most physicians doubtless do, whether prudence and good medical practice indicate the desirability of discreet disclosure to the patient or his immediate family. Suppose he tells the patient that he has been unable to make an accurate diagnosis and suggests a trip to a medical center or a hospital for detailed study. If the patient decides against going, the continuation of symptomatic treatment may proceed with better conscience and with less risk of legal repercussion. To conceal the inability often may render negligent the continuation of a treatment known to be inefficacious. Furthermore, the running of a large bill may become a fraudulent act if it is known that no benefit is being conferred and yet the patient is given to believe that a cure is in progress. I have shown that the consent of a patient, without a disclosure of the material facts due him, may prove in fact to be no consent. When, however, consent of the patient follows full disclosure, certain conduct which might give rise to liability for malpractice may become unactionable.<sup>12</sup> This result can be explained in different cases on different grounds, as for instance: (1) voluntary assumption of (a known) risk by the patient or (2) contributory negligence of the patient operating as a direct concurring cause of the injury.

Contributory negligence of a plaintiff will defeat his action for injury negligently caused by the defendant. The law does not recognize the doctrine of "comparative negligence"; no attempt is made to compare the relative degrees of negligence of the plaintiff and the defendant with a view to fixing "net responsibility." The law does not offset mild negligence against gross negligence. If the plaintiff has been contributorily negligent at all and this has added to the injury, he is barred from recovery. However, his contributory negligence is an affirmative defense which the defendant has the burden of pleading and proving in most states. Furthermore, a defendant who has caused a wilful or wanton injury cannot plead contributory negligence of the plaintiff to defeat his liability.

Situations revolving around the existence of a duty to disclose present novel and intriguing problems. In the English case of *Gerber v. Pines* (High Court—King's Bench Division) 1934, 79 Sol. Journal 13, the facts were these: Dr. Pines had been administering a series of hypodermic injections into the gluteus maximus muscle of Mrs. Gerber in treating her for rheumatism. He employed due care and skill in the performance but broke off a needle, which he was unable

to get out, and did not so inform the patient. Justice du Parc, after holding there was no negligence shown in the mode of injection or in the use of the needle, said, in substance:

The next question was whether the doctor should have told the patient at once of the accident. It seemed to him that a patient in whose body a doctor found he had left some foreign substance was entitled to be told at once. That was a general rule, but there were exceptions. In this case, there was a breach of duty and negligence on the doctor's part in not at once informing either the patient or her husband on the day of the accident. The damages must be very small indeed, and in his view a fair amount to award was five guineas, and there would be judgment for that sum for the plaintiffs, without costs.<sup>13</sup>

In *Hobbs v. Kizer* (U. S. Circuit Court of Appeals for New Mexico) 1916, 236 Fed. 681, 150 C. C. A. 13, the plaintiff was a patient of the defendant. She indulged in illicit intercourse with him and became pregnant. When she told him of her condition, he assured her she must be mistaken and asked to examine her in order to discover what her trouble really was. She consented, and he made an examination with instruments, at the conclusion of which he reported that she had an abscess of the vagina which demanded prompt operation. She consented, and an operation was performed from which she made a rocky convalescence. She filed suit on the ground that, in fact, the defendant had procured an abortion. The Federal Appeal Court affirmed the judgment entered in her favor below on a jury verdict. This type of consent could be regarded as ineffectual because procured by fraud; though there was consent to the operation, the quality of the consent was imperfect because the patient was not put in possession of the material facts to which she was entitled. Alternatively, one might put the case on the ground that defendant had only a limited authorization extending to treatment of an alleged vaginal abscess; any other or additional operations exceeded the consent given.

In *Logan v. Field* (Kansas City Court of Appeals) 75 Mo. App., 594, a physician sued for medical fees. The evidence showed that the defendant had previously paid the plaintiff \$122 for a prior course of treatments lasting several months which gave no relief from the chief complaint, nasal catarrh. On returning to the plaintiff for a further attempt, the patient said: "I don't want to run a big bill; and if you cannot cure me, I want you to tell me so. I have no money to throw away but am willing to pay you well if I can be cured." The physician replied: "I can't tell you now." During the next ten months the defendant was treated by the plaintiff sixty-five times, and at each treatment the plaintiff would say to him: "Your nose is getting along beautifully, beautifully." There was evidence that, in fact, no progress was being made and that the physician had expressed the opinion to others that the defendant's condition was incurable.

The physician recovered his fee in the trial court. That court refused to give the jury certain instructions requested by the defendant, these being to the effect that:

... the defendant had the right to rely on the superior knowledge of the plaintiff to his own, and if the plaintiff knew, or by the exercise of ordinary skill and judgment, could have

12. Thus, even though an operation might not have been necessary, yet had the plaintiff requested or consented to its performance, such consent or request would be a defense so far as that part of the case was concerned. The Nebraska Supreme Court so held in *Mosslander v. Armstrong*, 1912, 90 Neb. 774, 134 N. W. 922.

13. In *Ernen v. Croftwell* (Supreme Judicial Court of Massachusetts) 1930, 172 N. E. 73, 272 Mass. 172, 69 A. L. R. 1140, the evidence was held to warrant a finding that the defendant dentist should either have removed a broken procaine hydrochloride needle from patient's jaw or informed her of its presence there so that she could have it removed. The reasoning applies, of course, to any foreign body lost or left in the patient's body.



known that he could not cure defendant, or that there was great doubt whether he could successfully treat defendant's ailment, or that the treatment would probably be of no substantial benefit, he ought to have so informed defendant; and even though defendant received treatment and plaintiff did not guarantee a cure of defendant, yet, if the plaintiff, under such circumstances encouraged, or suffered defendant to take treatment without informing him that there could be no cure, or that there was great doubt whether he could be successfully treated, or whether the treatment would be of substantial benefit, and that the defendant, relying upon the superior skill of plaintiff, received such treatment in the hope of a cure but actually received no benefit therefrom, then the plaintiff ought not to recover.

The appeal court reversed the judgment entered below for the physician's fee and remanded the cause for a new trial on the ground that the defendant was entitled to the foregoing instructions to the jury. The court indicated that whether the unnecessary and unbeneficial treatment was applied for a long period as a result of deception or because of negligence in failing to follow the patient's clinical course would not vary the result; either finding by the jury on sufficient evidence would defeat the physician's right of compensation.

*Carey v. Mercer* (Supreme Judicial Court of Massachusetts) 1921, 239 Mass. 599, 132 N. E. 353, holds that in respect to orthodox procedures, such as making roentgenograms for a suspected fracture of the tibia, the physician discharges his duty when he advises the patient to have them made. On the patient's refusal, the physician is not negligent in failing to outline the probable consequences to him of his failure to have roentgenograms made. The Massachusetts Court rests heavily on this chain of reasoning: It is the patient's duty to follow the reasonable instructions of his physician; failure to do so constitutes contributory negligence proximately causing or contributing to the deformity consequent on failure to make an early discovery of the fracture by means of roentgen examination. This reasoning is sound in respect to "run-of-the-mill" transactions. It is not sound in respect to extraordinary ones or to cases in which proposed procedures will radically alter the status quo of the patient, with attendant risk. Some courts might find it difficult to consider the situation before the court in *Carey v. Mercer* as a "run-of-the-mill" transaction and hence to agree with the reasoning on which it was decided. Certainly, most physicians in a case of suspected fracture would consider a missed diagnosis as fraught with such portentous consequences as to require careful explanation to the patient of the need for roentgenograms.

#### 9. DUTY TO REFER PATIENT

Another novel problem to which I should at least allude is the question whether there is ever a legal duty to refer patients. Can the physician, morally and with legal safety say of a patient whom he cannot personally provide with "average" attention: "This is my fish, for better or for worse; I shall not throw him back into the medical pond"? This poses a question apt to become of increasing importance. I do not refer so much to cases in which the physician recognizes an emergency and almost invariably sends the patient to a hospital or to a specialist. I refer, rather, to cases he considers within his own sphere of action though he is not able to apply the learning, skill or equipment called for by current good practice in the community.

As a legal proposition, a physician courts the risk of liability for malpractice when, though he is unable to provide the facilities which the "average" practitioner knows to be necessary to the patient's interests, he holds on to the patient without disclosing the risk, offering to refer or associating a consultant. The same danger arises when one is able to carry out a desired procedure but only by a method which involves risk of injury to the patient, while others are equipped to apply a method so much safer that all risk is eliminated. The justifiable risk which one is warranted in taking becomes less and less as the harm threatened thereby increases in magnitude.

A highly important decision recently handed down by the Supreme Judicial Court of Massachusetts neatly illustrates the point. In *Vigneault v. Dr. Hewson Dental Company* (Supreme Judicial Court of Massachusetts) [1938] Mass. Adv. Sheets 807, 15 N. E. (2d) 185, the defendants injected procaine hydrochloride by pressure into the plaintiff's gums on several occasions before removing four abscessed teeth; in consequence, severe osteomyelitis of the plaintiff's jaw developed. The evidence showed that the danger of such a sequel was rather slight but that other dentists in the community could have reduced the risk to almost nil because they were equipped to use "deep block" anesthesia, which the defendants did not know how to apply. In affirming a judgment for the plaintiff for \$4,450, based on an auditor's findings of negligence, the highest appeal court of Massachusetts said:

The defendant contends that negligence could not rightly have been found since "danger was remote." But remoteness of danger is a matter of degree. Though the danger was remote, it might, none the less, involve an unreasonable risk of harm to the plaintiff to which dentists, in the exercise of the skill required of them, should not have exposed him. . . . This is particularly true where, as here, the possible harm was of a serious nature. . . . A finding of negligence was not precluded, even though there was a substantial probability that harm might not actually result from the use of this method of anesthetization. A choice by a dentist of a "less safe method" rather than another "well-known method" may constitute failure to exercise the requisite skill in extracting the plaintiff's teeth. See *Galvin v. Old Colony Railroad Company*, 162 Mass. 533, 39 N.E. 186. There is nothing in the findings of the auditor to show that any emergency required the use of the "less safe method" or that a safer method was not available for the plaintiff at the hands of some other dentist. Nor is there anything in the findings inconsistent with the finding that the defendant's dentists should have advised the plaintiff to employ another dentist equipped to use a safer method of anesthetization, rather than have "undertaken a less safe method." Such may be the duty of a dentist who, for any reason, is unable personally to exercise the skill ordinarily exercised by dentists in the community. (*Mollen v. Boynton*, 132 Mass. 443, 446.) See, also, *Small v. Howard*, 128 Mass. 131, 136, 35 Am. Rep. 363. The finding of negligence must stand.

I could cite many cases in which practitioners have been held negligent in failing to seek roentgenograms in diagnosing or following up cases of fractures (with consequent poor end result), even though they themselves owned no x-ray apparatus and the use of the required facilities would have required the original physician to refer the patient to some one else, to call in a consultant with a portable machine or even to surrender the care of the patient to a hospital.

This duty of reference, which so lately has entered into cases at law, is of profound importance because of the increasing disparity between the equipment an individual physician can afford and that available in

hospitals or other medical institutions. Whether the duty to refer exists in a given case can, with a near approach to accuracy, be answered by adverting to this important criterion: what is the practice of the average prudent physician in the community in respect to referring a case such as this? When I allude to a duty to "refer," I wish it understood that this duty often can be met as satisfactorily by associating a specialist in the joint conduct of the case.

#### 10. WAS THE ALLEGED DERELICTION ACTUALLY OUTSIDE THE SCOPE OF THE PHYSICIAN'S EMPLOYMENT?

Inquiry should always be made as to what was the problem of health which the physician in the particular case was called on to handle. Does the alleged dereliction apply to some ailment which really falls outside the scope of his employment?

*Example.*—X, a general practitioner, was called to treat Y for typhoid fever. This he did with success. During the same time, Y had been having subjective ocular symptoms and disturbances of vision, due to a local condition in the eye, which fell within the province of an ophthalmologist. Y later lost the sight in one eye, and an oculist testified he could have saved her sight had she been sent to him earlier. She sued X for negligence. (*Jones v. Vroom* [Court of Appeals of Colorado, 1896] 8 Colo. App. 143, 45 Pac. 234.)

The upper court held that the trial court properly instructed a verdict for X, since Y had employed him only to treat the typhoid fever; the other complaint lay outside the scope of his employment. He had no duty to treat the ocular condition. In respect to the duty to refer, the evidence clearly showed that Y herself was aware of the condition of her eye and of the need of an ophthalmologist and that she could have procured the services of one by telephoning to a nearby town. It was as though X had told the patient of an ocular condition which fell outside his field of practice and had advised her to see some one else. The case could therefore rest on lack of proximate causation: the patient's own neglect was the proximate cause of the injury she suffered. The case is thoroughly sound, except for the embarrassing fact that X had promised to procure an ophthalmologist for Y and did not. The court reasoned that when Y saw, after many days, that X was not going to act she, herself, could have telephoned an ophthalmologist. The fault of such reasoning is this: Y could reasonably suppose that X, as an informed man, could procure for her a more suitable specialist than she herself might choose and so could justifiably await his action, with resulting detriment. Even in 1912, this feature would have carried danger of liability had Y offered, as she did not, medical testimony that local practice deemed it negligent for a physician to fail in the execution of a voluntarily assumed undertaking to procure suitable medical aid. As the general physician more and more acquires the status of a family counselor on health, the reasoning on which this case was rested becomes less and less valid.

#### 11. LEGAL EFFECT OF VOLUNTARILY ASSUMING HIGHER DUTY THAN PHYSICIAN-PATIENT RELATIONSHIP WOULD CREATE

I have pointed out that the scope of duty can be voluntarily enlarged by express contract provisions. It is my theory that infringement of these "extra security" clauses, with nothing more, constitutes only breach of contract and not a tort.

As illustrations, I can cite instances in which the physician has "guaranteed" a cure to the patient. These contracts form a class which may be called "no cure, no pay" agreements, for if the physician does not fulfil the guarantee, no obligation to pay arises. But this failure to perform a greater duty than the law implies, with no "dereliction" as judged by "average" standards, does not constitute a tort. It is not malpractice at all but a mere breach of contract. It is important for the courts to receive and to apply this distinction.<sup>14</sup>

#### 12. TO WHAT EXTENT CAN SCOPE OF DUTY BE REDUCED BY EXPRESS CONTRACT?

Can the scope of duty be reduced by express contract and, if so, in what respects? I believe that the scope of medical duty can be lessened only to the extent that disclosure to the patient and the latter's consent can effect a reduction of duty, as previously described.

Suppose X, a physician, goes further and has his patient sign a written contract reading: "Y, as patient, in consideration of his treatment by X, hereby agrees to waive all requirements as to knowledge, judgment, care and skill and any claim for damage arising from failure to apply same to his medical care." Such a contract would defeat the public policy of maintaining a minimum standard of skill in the practice of medicine, since licensure statutes can adequately protect only against want of knowledge. It would also open the door to imposition on the weak and the credulous. Society has an interest in securing the health of its citizens, both in respect to preserving their economic self sufficiency and in keeping them fit for the possible defense of the nation. It has a further interest in protecting the more proficient physician from the irresponsible competition of a class relieved by "contract waivers" from the responsibility which every conscientious physician considers rightfully his in dealing with patients. For these reasons, whenever "total waiver" clauses come before the courts, they have good warrant for holding them void as against public policy.

#### 13. WHAT ARE THE SALIENT PRINCIPLES OF CRIMINAL RESPONSIBILITY FOR MALPRACTICE?

I have already shown that criminal liability for murder, manslaughter or assault and battery can be based on reckless conduct, even though there was no intention to cause death or to inflict injury. The degree of recklessness which must be found for criminal liability is greater than the minimum necessary for civil liability for malpractice. For murder, the jury must find that the course of treatment was "imminently dan-

14. The distinction I contend for has been indirectly recognized in *Frankel v. Wolper*, 1918, 181 App. Div. 485, 169 N. Y. Supp. 15, a case in which the court had occasion to state the measure of damages recoverable for breach of an agreement to cure. It said: "The defendant would not be liable, upon his agreement to cure, for plaintiff's pain and disability resulting from the conditions to be cured, or for pains and disabilities caused by defendant's ignorance, or lack of skill, or for pains and disabilities caused by subsequent operations to cure her of her malady, or to avert the consequences of defendant's lack of skill, or failure to perform his contract, or expenses to alleviate any such pains and disabilities. The contract to cure was not that the defendant would, upon failure, pay the damages resulting from her malady continuing, or for the results of his lack of skill, or ignorance, or for the physical consequences of treatment by other physicians necessitated by her condition. The thing he undertook was to cure her. That did, indeed, involve the elimination of the condition that begot suffering and disability. But a physician cannot be held responsible for suffering from a cause which he agrees to end, but does not, unless he is guilty of malpractice. . . . I would say, also, that where a physician, with whatever prudence, agrees that his treatment will cure, and it does not, the patient is absolved from payment, may recover advances, may recover expenditures necessitated for nurses and medicines, and may be for something else." (Affirmed: 1920, 228 N. Y. 582, 127 N. E. 913.) Whether the damages for breach of a guaranty to cure will be so confined by the courts of all states is subject to some doubt on legal principle.

15. Mr. Livingston Hall, professor of criminal law, Harvard Law School, supplied the material contained in this section.

gerous to the patient" and showed a "depraved mind regardless of human life." Typical examples in the law include shooting recklessly into a house or a vehicle in which people are known to be or driving through a crowded street at extreme speed while intoxicated. Obviously, it is highly unlikely that any physician would be guilty of such gross dereliction of duty as to incur liability for murder on this ground.

There are a number of prosecutions against physicians for manslaughter, instances in which death has been caused by the gross negligence or recklessness of the attending physician. In England, it has been well settled that:

... in order to establish criminal liability the facts must be such that, in the opinion of the jury, the negligence of the accused went beyond a mere matter of compensation between subjects and showed such disregard for the life and safety of others as to amount to a crime against the State and conduct deserving punishment. (*Rex v. Bateman*, [1925] 19 Cr. App. Rep. 8.)

The matter was more recently put by the House of Lords in a case involving reckless driving thus:

Simple lack of care such as will constitute civil liability is not enough; for purposes of the criminal law there are degrees of negligence; and a very high degree of negligence is required to be proved before the felony is established. Probably of all epithets that can be applied "reckless" most nearly covers the case. It is difficult to visualize a case of death caused by reckless driving in the connotation of that term in ordinary speech which would not justify a conviction for manslaughter; but it is probably not all-embracing, for "reckless" suggests an indifference to risk whereas the accused may have appreciated the risk and intended to avoid it and yet shown such a high degree of negligence in the means adopted to avoid the risk as would justify a conviction. (*Andrews v. Director of Public Prosecutions* [1937] A. C. 576.)

It will be noted that by these English cases there can be no conviction for manslaughter unless the defendant has appreciated that there is a considerable risk of death involved and has either failed to take precautions or has taken inadequate precautions to guard against it. In some American jurisdictions a similar requirement is found, and a physician who honestly believes that no substantial risk of death is involved in his treatment cannot be convicted (*State v. Shultz*, [1881] 55 Iowa 628, 8 N. W. 469, 39 Am. Rep. 187).

In some American jurisdictions, however, a conviction for manslaughter has been upheld when the conduct of the physician was grossly negligent, even though it cannot be proved that the physician realized that his conduct was dangerous. Justice Holmes, in affirming a conviction of manslaughter against a physician who had treated a woman by keeping her in flannels saturated with kerosene for three days, apparently in the honest belief that this treatment would be beneficial, put the test thus:

The defendant knew that he was using kerosene, the jury have found that it was applied as a result of foolhardy presumption or gross negligence, and that is enough. Indeed if the defendant had known the fatal tendency of the prescription, he would have been perilously near the line of murder. (*Commonwealth v. Pierce*, [1884] 138 Mass. 165, 52 Am. Rep. 264.)

The same standard as to recklessness is applied in a prosecution for assault and battery for causing injury short of death by reckless conduct as is applied in determining whether the defendant would have been guilty of manslaughter if the victim had died.

### 3. HAD THE DUTY, THOUGH ONCE EXISTENT, BEEN EXTINGUISHED BEFORE THE TIME OF THE ALLEGED DERELICTION?

Suppose, as in the usual case, the physician is treating the patient under an implied contract of employment. It is expected that he will visit as frequently and as long as is reasonably necessary. There is no specified time limit to his connection. The relation may be ended at once by mutual consent or after any given visit by notice from the patient. Since protection of the patient's health is of prime concern, the physician cannot sever his connection so abruptly. He can withdraw in absence of the patient's consent only after giving reasonable notice in advance, so that the patient may have a fair opportunity to engage a successor.

Suppose the treatment is under a formal contract. In this case, the relation ends only when the performance specified in the agreement is concluded. The patient cannot discharge the physician before that time except for cause, that is to say, a breach of contract.

If the patient knows of the custom in advance and the contract does not forbid, a surgeon may leave the care of the patient after an operation to the regular hospital staff.

Thus it is seen that whether the physician's engagement is under express or under implied contract, unless the services are sooner discontinued by mutual agreement or by rightful termination a legal duty exists to attend the patient until he can be discharged safely.

In the case of emergency aid given to a wayside victim, the passing physician who assumes to act comes under no duty to continue the injured man as his patient. His duty is to see that he does not leave him in worse circumstances than those in which he found him. This obligation is discharged either by putting him on the way to a hospital or, after rendering imperative first aid, seeing that the persons who assume charge of the injured man will undertake to get him to suitable medical care within the period of safe delay.

In accepting a gratuitous patient, the physician takes him under no binding agreement to continue treatment for any definite term. He may withdraw after giving reasonable notice of his intention. Theoretically, he can drop the patient "instantly" if he leaves him in no worse condition than that in which he found him. Some courts may hold that the danger of injury to the patient's health from sudden discontinuance raises a duty of advance notice. When such a patient does not assent to the immediate termination and is still sick, the careful physician will do well to give even the gratuitous patient a few days' notice of his withdrawal. Likewise, a hospital cannot afford to order a sick patient to pick up his bed and walk without similar regard to a reasonable opportunity for him to arrange a destination.<sup>16</sup>

If the physician will apply these concepts of duty to every action or omission, proposed or past, of his medical conduct, he will come close to knowing whether negligence is involved in the transaction under scrutiny.

## II. DERELICTION

My formula of liability for malpractice is duty dereliction, direct causation and damage. Presence of "duty" resting on the physician implies a correlative legal right in the person to whom the duty is owed. "Dereliction" implies a breach of this duty and a consequent invasion

16. However, it seems that a physician can legally terminate his relationship with a gratuitous patient instantly by tender then and there of a competent substitute.

of plaintiff's legal right. Duty and dereliction are thus closely intertwined, and in dealing with dereliction in this section I am in measure recapitulating all the duties owed by the physician and asking whether he has breached one of them. Indispensability of the concurrent existence of all four D's must never be lost sight of; mere faulty performance, in absence of any duty, constitutes no legal wrong. Conversely, mere duty, without proof of faulty performance, constitutes no legal wrong in respect to which recovery at law can be had.

It is important to grasp the rather neat point that not all legal liabilities arising from medical conduct are malpractice. This is a concept worth stressing, both in elucidating the legal position of the physician here and in appearing before courts. Even though the measure of damages will often be the same, the physician is entitled to have the rather malignant term "malpractice" correctly applied and not used in a loose and overbroad sense. Table 2 seeks to embody this proposition and to make the correct analysis clear.

TABLE 2.—*Legal Liabilities Arising from Medical Conduct*

### A. Distinction Between True Malpractice and Liabilities Resting on Independent Grounds

## 1. Malpractice

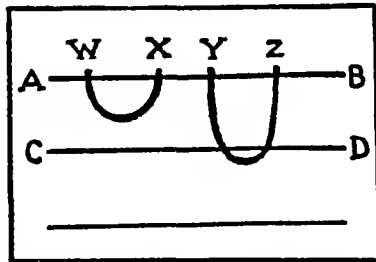
- (1) Liability for tort (negligent practice, etc.) to one who is a patient
- (2) Liability for medical conduct toward a patient which would constitute a tort without existence of physician-patient relationship (e.g. false imprisonment or battery)
- (3) Liability for faulty medical conduct (1 or 2) intended to affect the other person, even though that person's unwillingness to accept the actor as his physician prevents true consensual relationship of physician and patient from ever arising

## 2. Not Malpractice

- (1) **Liability for failure to fulfil superduties assumed by contract; this is mere breach of contract. Level of performance required by superduties assumed by contract (A-B)**

Duty of care, knowledge, judgment and skill required by law of torts without any express agreement (C-D). In event of superduties assumed by contract: performance W-X = breach of contract only, performance Y-Z = tort and malpractice as well as breach of contract.

- (2) Liability for failure or refusal to establish physician-patient relationship as agreed in advance by contract. This, likewise, is a mere breach of contract
- (3) Medical conduct which is negligent as to third persons not intended to be affected but injured by careless practice



**Example:** Surgeon X, while attending the plaintiff's husband, directed the plaintiff to assist in dressing a wound, knowing there was danger of infection but negligently assuring her to the contrary. The plaintiff relied on his advice and was infected through scratches on her finger. X is liable. (*Edwards v. Lamb* [Superior Court of Judicature, N. H.] 1889, 45 A 480, 60 N. H. 599)

Example: J. was the sole attending physician of T. who had black smallpox. J. assured a neighbor, S., that T. had no contagious disease and that S. would take no risk by waiting on him in his illness. S. waited on T. and helped to prepare his body for burial; in consequence, he contracted smallpox and died. J. is liable in n suit for 'wrongful death' brought by S.'s widow, if a general practitioner of average ability should have diagnosed the malady: (Jones v. Stanko [Ohio Supreme Ct.] 1928, 118 Ohio St. 147, 160 N. E. 456)

The physician owes the duty which the motorist owes, to avoid exposing those in his sphere of action to unreasonable risk of harm; in short, he carries the general duty of care which all persons share.

### B. More Detailed Analysis of Dereliction in Malpractice

## Negligence

1. Affirmative act (malfeasance) constitutes negligence if improperly performed even though no preexisting duty was owed to the person affected (in necessity to prove mutually agreed physician-patient relationship but only the physician's assumption to act in a medical way toward the person injured.)
2. Omission to act (nonfeasance) constitutes negligence only if the defendant owed a duty to the injured person to do the omitted thing
3. "Ordinary" negligence and "gross" negligence must be distinguished; the latter is such reckless, wanton or extreme negligence that the injured party is entitled to "punitive" as well as compensatory damages

### Intended Acts or Omissions

1. **Battery.**—The touching of another without consent, as in operations going beyond authorization or unauthorized physical examinations
2. **False Imprisonment.**—The forcible deprivation of the right of another to go where he pleases by holding him captive against his will and without legal justification
3. **Slander.**—Physician tells a stranger that patient X has syphilis when such is not true and physician has acted on negligent diagnosis and not in good faith. (Libel if communication is written rather than spoken)
4. **Interference with Property Rights.**—Violation of property rights in dead bodies, as by performing unauthorized autopsies. (Coty v. Baughman [South Dakota Supreme Court] 1926, 210 N. W. 348; \$1,500 judgment for autopsy performed without consent)
5. **Breach of Trust Relationship.**—(1) Failure to disclose material facts to the patient under circumstances which raise a duty to speak. If the suppression is not intentional, the failure to disclose may be negligence. If intentional, it may constitute actionable fraud or deceit. (2) Query: Liability for disclosure of confidential communication?
6. **Fraud.**—Intentional misleading of patient on a material matter, the patient reasonably relying to his injury on a statement of fact
7. **Violation of Certain Statutory Duties.**—If intended for patient's exclusive benefit
8. **Professional Conduct Toward Patient Constituting Criminal Law Offense.**—This usually confers simultaneous rights on patient to proceed in "tort" for civil compensation of the injury suffered
9. **N. B.:** As I have pointed out in an earlier portion of this paper, it is customary in the law of torts to divide wrongs into negligent conduct and intended conduct. Nevertheless, intended conduct, which may be a tort on that score, may also be a tort on the separate or alternative ground of negligence. This is the case if the conduct is of a character called bad practice by the medical profession of the time and place (e.g., when a surgeon, contrary to the customs of surgeons, breaks a united callus without the patient's consent; this act is a "battery" but it is also liable as "negligence")

## Dereliction

These are "torts" recognized by general law without need of proving any special relationship such as that of physician and patient. Yet they constitute "malpractice" when committed in medical practice or associated conduct knowingly directed toward another person as the object of the medical attention, even though the strict relationship of physician and patient is not demonstrable.

These are "torts" dependent on existence of a physician-patient relationship. In such cases "malpractice" can be made out only by proof that such a relationship existed.

No more will be said as to the legal liabilities which may flow from medical conduct independently of malpractice. Table 2, aided by previous discussions, should make this aspect clear. "Malpractice" is somewhat of a "weasel" word. To different minds it has different connotations. First of all, one should distinguish "criminal malpractice," with its implication of moral turpitude, and "civil malpractice," which may be entirely neutral in its moral aspects. It might be argued that the term "malpractice" properly applies only in respect to the alleged wrongful conduct when (1) it occurred in respect to an existing physician-patient relationship and (2) it would constitute no legal wrong in the absence of such relationship. Under this analysis, malpractice would comprise only negligent conduct and breach of those duties which depend strictly on the physician-patient relationship. It would not include battery, false imprisonment, slander or violation of property rights in dead bodies, for this conduct carries legal liability when indulged in even toward a stranger without any proof of a physician-patient relationship. These acts are "torts" on their own, without any necessary reliance on a special consensual relation between the parties.

This approach would be not illogical; its weakness lies in the fact that such a concept of medical malpractice goes too far in excluding from the definition transactions which actually are performed in the course of medical practice. It is better, therefore, to consider "malpractice" as extending to all alleged injuries arising from medical activity or conduct in the course of practice knowingly directed toward another person as the object of the medical attention, even though the strict relationship of physician and patient is not demonstrable.

This concept is broad enough to cover the case in which a physician treats an injured person whose unconsciousness prevents actual consent and the lack of an emergency precludes implied consent. It also covers the cases of treating persons incapable of consenting, for instance insane persons, and a variety of other situations which may arise from time to time.

As illustrations, I shall mention briefly two interesting decisions. In *Harriott v. Plimpton* (Supreme Judicial Court of Massachusetts) 1896, 166 Mass. 585, 44 N. E. 922, the plaintiff was engaged to be married to the daughter of X. He was seen by a fellow lodger treating a traumatic lesion of his genitals. This officious busybody relayed his observations to X. The latter much desired the plaintiff to consult the defendant in order that an examination for venereal disease might be made before the nuptials were performed. The plaintiff willingly acceded and repaired to the defendant's office, never intending to become the latter's patient. Note that the defendant did not make his examination with a view to treatment but solely for the purpose of giving information.

The defendant made a negligent diagnosis of gonorrhea, which was duly communicated to X and his daughter, with the result that the engagement was broken. In fact, the plaintiff had no venereal disease whatever. He sued the defendant, and the jury found the examination was negligently performed. From a judgment for the plaintiff on the verdict, the defendant filed a vigorous appeal. The Supreme Judicial Court of Massachusetts held that duty existed despite the nontherapeutic purpose of the examination, that the defendant breached the duty by his negligent examina-

tion and that the breaking off of the engagement to marry was not too remote or unforeseeable a consequence to constitute a legal damage. The court affirmed the judgment for the plaintiff.

In *De Freville v. Dill* (King's Bench Division) 1927, 105 Law Journal 1056, 96 L. J. K. B. (N. S.), an interesting situation came before the English courts. A had married B, the son of a vicar, X. B, having tired of his "better half," returned to his point of origin, where he was warmly welcomed by X and reincorporated into the household. On several occasions, A forced her way into this same haven, feeling her matrimonial rights extended to the privilege of being with her husband, though to X she was a persona non grata. After one such episode, when A had entered X's household by the back way, X promptly called in Y, a local practitioner, to make a psychiatric appraisal. After several calls, colored by a distinctly negative attitude on the part of A to this scientific "sizing up," Y signed a lunacy certificate and had A carried to a mental hospital pending final hearing. A day later, the physician-in-chief of the mental hospital promptly discharged A as a sane person, and she filed suit against Y. The jury specifically found that no relationship of physician and patient existed, for A never agreed to take Y as her doctor and, in fact, looked with hostility on his interference. They also found that Y acted in good faith and without malice but negligently. The Court of Appeals held that a verdict and judgment in A's favor against Y must be affirmed. The recovery was for £50.

In the usual case, a relationship of physician and patient will exist by mutual understanding of the parties. Furthermore, "negligence" will usually be the fault charged. Such dereliction in the medical conduct usually consists of some act or omission which threatens a foreseeable, unreasonable risk of injury to the person affected. In such case, the conduct is negligent if the "average" practitioner would regard the act or failure to act as bad practice. I have shown that a mere failure to act is not negligence unless there is a duty to act. What is an unreasonable risk varies with the magnitude, imminency and gravity of the harm which may ensue and the counterbalancing good to be secured. Thus, even a small risk which threatens the loss of a man's life may well be unreasonable and so negligent, while a greater risk of a much lesser harm, such as temporary induration of an arm from a testing for serum sensitivity, might not be negligent. The interest to be secured by the proposed conduct and the likely results of contrary action, as shown by competent medical testimony, are also to be weighed by the jury in determining the crucial question of negligence. The fact of a patient's consent, after a full disclosure, may at times strip a transaction of its negligent character, as when an unnecessary operation is done as a "long chance" at the patient's behest.

Yet, though "negligence" is by far the most common form of malpractice, it is not the only culpable medical conduct directed toward another which may constitute an actionable tort and so a "dereliction." As I have said previously, "torts" are all those injuries to the rights of personality or property of one person occasioned by invasions of another person which occur without legal justification. The variety of "torts" which may constitute malpractice because they arise from medical conduct directed toward another is illustrated in part B of table 2.

(To be continued)



## Council on Pharmacy and Chemistry

### REPORTS OF THE COUNCIL

BECAUSE OF THE NEED FOR AN AUTHORITATIVE STATEMENT ON THE PROPERTIES OF THE SYMPATHOMIMETIC AMINES AS SUBSTITUTES FOR EPINEPHRINE, DR. M. L. TAINTER, WHO HAS DONE MUCH WORK IN THIS FIELD, WAS ASKED TO PREPARE A SUMMARY OF RECENT WORK ON THIS SUBJECT. IN AUTHORIZING PUBLICATION OF THE FOLLOWING REPORT THE COUNCIL WISHES TO EXPRESS ITS APPRECIATION TO DR. TAINTER FOR HIS EXCELLENT SUMMARY.

OFFICE OF THE COUNCIL.

### THE SYMPATHOMIMETIC AMINES AS EPINEPHRINE SUBSTITUTES

#### A GENERAL SUMMARY

M. L. TAINTER, M.D.

SAN FRANCISCO

Since the introduction of epinephrine as a therapeutic agent some forty years ago, there has been an increasing interest in possible synthetic substitutes which might have advantageous qualities over that of the original drug. Ephedrine and tyramine, which occur in nature, have been thoroughly studied but are being encroached on by synthetic agents of related structure. This report is concerned with certain aspects of the chemical composition and actions of those members of this group which are now being advocated and made available in this country for clinical use.

#### GENERAL CIRCULATION

The most striking action of these drugs is their power to stimulate the circulation. The pressor effects are produced by arteriolar constriction and possibly increased cardiac output accompanied by variable effects on heart rate. The pulse rate effects are variable since, although the drugs tend to cause great acceleration, this may be changed to distinct slowing if the vagus reflex mechanism is sensitive. These circulatory actions are used in combating failure of the circulation from a variety of causes. During acute emergencies, as in accidents of anesthesia and in drowning, the injection of these drugs may result in the saving of life. The drugs useful for this purpose, besides epinephrine salts, are those with strong cardiovascular actions. Cobefrin hydrochloride,<sup>1</sup> neosynephrin hydrochloride, ephedrine sulfate or hydrochloride and propadrine hydrochloride are probably the best examples in the order named. When there has been a serious fall of blood pressure during spinal anesthesia, or to prevent such an accident, any of these drugs may be used, provided their duration of action and dosage is such as to meet the needs of the particular clinical condition. Ephedrine salts appear particularly useful for this purpose, since these have prolonged actions, although neosynephrin hydrochloride is also effective but of more transitory duration. The other members of this group have not been extensively enough used under such conditions to allow any opinion as to their relative merits. Surgical shock is rather poorly combated by any of these, except temporarily, and recourse must be had to other methods, such as restoring blood volume, which give more permanent results.

#### LOCAL ANESTHESIA

The vasoconstriction is also used to prolong local anesthesia. The synthetic substitutes for epinephrine

hydrochloride which have been tested in this connection are cobefrin hydrochloride and neosynephrin hydrochloride. A concentration of 1:10,000 cobefrin hydrochloride and 1:2,500 of neosynephrin hydrochloride is clinically equivalent to about 1:50,000 of epinephrine hydrochloride. Both are satisfactory, although they tend to permit somewhat more bleeding than the latter drug. Otherwise the differences between all three in local anesthetic solutions are too small to detect, except from comparisons of very extensive data, because the duration, intensity, speed of onset and other factors are very much alike. The salts of other sympathomimetic amines, such as amphetamine sulfate, propadrine hydrochloride and ephedrine sulfate or hydrochloride, have not been demonstrated to be of value for this purpose, probably because their vasoconstrictor power is inadequate.

#### DECONGESTIVE EFFECTS

Another vascular effect which is utilized clinically is the shrinkage of turgescient mucous membranes, as in rhinitis and other nasal conditions. All the compounds in this group shrink such mucosae with a clinically useful degree of efficiency. Epinephrine or its hydrochloride is not generally preferred for this purpose because it produces so much constriction that the resulting tissue anoxemia and the secondary active vasodilatation and irritation are apt to give rise to delayed local edema and swelling. The most popular compound has been ephedrine or its salts, which in concentrations of about 1 to 3 per cent produces moderately complete blanching of the nasal mucosa. An equal, if not greater, degree of constriction is produced by 0.25 per cent neosynephrin hydrochloride and by higher concentrations of amphetamine or propadrine hydrochloride. These nasal preparations are used in the form of aqueous or liquid petrolatum solutions, with or without the addition of aromatic principles, except the volatile amphetamine, which is dispensed in the form of an inhaler tube. The aromatized liquid preparations and the amphetamine vapors are frequently irritating and therefore should be used only in those conditions in which acute inflammation is not present. It seems unlikely from the clinical evidence that any of these compounds has a decisive advantage over the others in the degree of irritation which its aqueous solutions produce. Various special solutions of these agents are advocated, wherein the solvent has been buffered or made isotonic by the addition of physiologic solution of sodium chloride mixtures or dextrose. While these may be better theoretically than the more acid solutions which result when they are dissolved in physiologic solution of sodium chloride, any real advantage does not seem to have been adequately established by the clinical reports thus far available. Similarly, there seems to be no acceptable proof that the addition of antiseptic agents to these solutions is a beneficial modification.

#### MYDRIASIS

All these drugs dilate the pupil, so that they can be used as clinical mydriatics, particularly when combined with atropine or its derivatives. Although there are a number of favorable clinical reports of such uses, these drugs do not appear to have attained great popularity as mydriatics.

#### BRONCHII

Bronchial dilatation is produced in a dramatic way by epinephrine hydrochloride, but to a much lesser extent by the substitutes. Neosynephrin hydrochloride, ephedrine sulfate or hydrochloride and propadrine

From the Department of Pharmacology, Stanford University School of Medicine.

1. Cobefrin hydrochloride is the proprietary name for racemic 3,4-dihydroxy-phenyl-propanolamine hydrochloride, manufactured by the Winthrop Chemical Company. It does not stand accepted by the Council on Pharmacy and Chemistry.

hydrochloride are moderately effective for this purpose, although their action seems to be best in the milder cases of bronchospasm. The musculature of the gastrointestinal tract is generally relaxed by these compounds, but the effects seem to be produced only in doses which cause definite changes in the circulation. This fact therefore limits their clinical usefulness in gastrointestinal disorders. However, they have been used to advantage in facilitating radiologic examination, when spasm may complicate the interpretation of fluoroscopic examinations.

#### ABSORPTION AND FATE

The absorption of these drugs, when taken by mouth, is controlled by a number of physiologic factors. If the agent is a very effective vasoconstrictor, it limits its own absorption by reducing the blood flow through the mucosa of the gastrointestinal tract. If the compound is chemically unstable, it is destroyed by the digestive ferments or by the liver as the blood passes through it on its way to the general circulation. For this reason, oral effectiveness occurs mainly with those compounds which are chemically stable and which have lesser degrees of vasoconstrictor power. Ephedrine sulfate or hydrochloride, amphetamine sulfate and propadrine hydrochloride are rather effectively absorbed and therefore can be administered clinically in this way with fairly reliable effects. Neosynephrin hydrochloride also has some demonstrable potency by mouth, although the dose must be vastly increased over that which is effective by parenteral administration. Those compounds having a catechol nucleus, such as epinephrine hydrochloride, cobefrin hydrochloride and kephrine hydrochloride, are almost completely inactive by the oral route.

After absorption, the compounds with a phenolic or catechol nucleus, such as epinephrine hydrochloride, cobefrin hydrochloride, neosynephrin hydrochloride and kephrine hydrochloride, are mainly destroyed in the body. On the other hand, those compounds without the hydroxyl group on the benzene ring, such as ephedrine sulfate or hydrochloride, propadrine hydrochloride and amphetamine sulfate, apparently resist chemical change much more completely and can be identified in important amounts in the urine. Since the duration of action of these drugs is related to the ease with which the body can destroy or eliminate them, the actions of the former compounds tend to be of short duration, whereas those of the latter are prolonged, the exact duration being modified by the dose administered. Possibly because of this same difference in rate of elimination the compounds of the latter group tend to show tachyphylaxis; that is, they tend to have a sharply decreasing effect with successive doses, particularly when the administrations are made at short intervals.

#### TOXICITY

The toxicity of these drugs is produced through two major mechanisms. First, there is the stimulation of the circulation, which, if too much may give rise to acute cardiac dilatation with pulmonary edema, vascular accidents and other sequelae of acute hypertension. The other objectionable side effects are those resulting from central stimulation; that is, nervousness, general excitement, tremors and insomnia from direct irritation of the central nervous system. In hyperthyroid states the circulatory response to epinephrine is increased, so that

the dosage must be reduced if too strong a response is to be avoided. Whether the same increased sensitivity is seen with the other compounds is not certain. It is probable that the same caution should be used in patients with hypertension, since in them added cardiovascular strain may be dangerous. The cardiovascular toxicity is important mainly in the case of epinephrine, since, with the other agents, the doses required to produce such circulatory effects are considerably beyond any which are apt to be used in practice.

The margin of safety with respect to the stimulation of the circulatory system increases with the greater deviation from the epinephrine structure. Clinical observations on severe or fatal toxicity of these products for human beings is sparse, so that no accurate estimates can be made as to what the human fatal doses might be. However, animal experiments indicate fatal effects in the dose range of 10 to 50 mg. per kilogram or more. These quantities are high enough to indicate the wide margin existing between these amounts and the doses employed clinically. Because of this unusually high safety margin, claims for the superiority of one compound over another based on the cardiovascular toxicity have little significance.

#### CENTRAL EFFECTS

Stimulation of the central nervous system is apparently not dependent on the cardiovascular effects, since there is no correlation between potency for the circulation and that for central excitation. The most effective central stimulant is amphetamine sulfate, with ephedrine and epinephrine salts producing lesser effects in the order named. The amount of such action is minimal or completely lacking in any tolerated dose with neosynephrin hydrochloride and propadrine hydrochloride. There is a great difference in the potency of the optical isomers, the dextro-amphetamine being considerably more active than the levo form. Conversely, levoephedrine is a more potent excitant of the central nervous system than is its dextro derivative. In each case the racemic mixture is intermediate in action, as might be expected. These facts also emphasize the lack of agreement between cardiovascular actions and those on the brain, since the levo compounds are the more active circulatory drugs. Cobefrin hydrochloride produces central stimulation in patients comparable to that of epinephrine salts, although it is probably less effective in animals in doses which can be withstood by the cardiovascular system. The relative intensity of these central effects are extremely difficult to judge in human beings, because of the lack of efficient quantitative methods and because they are so frequently superimposed on psychic effects arising from operative or other procedures, or the disease state itself.

#### STYPTIC USES

Kephine hydrochloride, the base of which is the ketone precursor of epinephrine, has been used for many years in Europe under the name of adrenalone, for local application as a styptic. It would seem to have some merit for this purpose when applied locally in dusting powders or impregnated on gauze in packing oozing wounds. It has a low order of vasoconstrictor power which is unlikely to give rise to serious local anoxemia. The other agents might conceivably be used in the same way, although they have not been actively advocated for this general type of application, except perhaps during acute surgical emergencies.

## UNSOLVED PROBLEMS

Problems which are attracting close attention at the moment relate to possible differential effects of these drugs and related agents on the circulation. These are concerned with preponderance of actions of some of these agents on the heart as compared to the peripheral vessels, or on the venous side of the circulation as compared to the arterial side. Such studies have not yet gone far enough to demonstrate clearly that the differences observed are not primarily the result of differences in the relative dosages tested. If it can be clearly demonstrated that certain of these agents have predominant actions on some part of the circulatory system, a means may be afforded for selecting more rationally the drug to be used under a given clinical condition of cardiovascular failure.

Attention is also being given to the possibility of drug addiction from the central stimulation of amphetamine and its sulfate. The effectiveness of amphetamine on the central nervous system is much greater than that of caffeine or the other common central stimulants and resembles qualitatively the actions of cocaine. Since amphetamine sulfate frequently causes euphoria or other pleasant symptoms and is used by the public as a "pep-up" drug to restore failing energy or to ward off the effects of fatigue, the conditions are present for establishing addiction. The profession may do well to remember that cocaine was used for centuries before its addiction properties were recognized, that heroin (diacetylmorphine hydrochloride) was used as a cure for addiction to morphine, and morphine for alcoholism, and that historically the recognition of addiction has always lagged considerably behind the introduction of the drug in question. Therefore, until the propensities of amphetamine and its sulfate in this connection are thoroughly understood and the dangers fully assessed, it would seem wise to use this agent only in those conditions in which a definite need for it has been demonstrated and the conditions tending to establish addiction are not present.

## NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATIONS.

OFFICE OF THE COUNCIL.

**BACTERIAL VACCINE MADE FROM THE TYPHOID BACILLUS** (See New and Nonofficial Remedies, 1940, p. 461):

The Upjohn Company, Kalamazoo, Mich.

*Typhoid Vaccine*.—A suspension made from a single strain, namely *Eberthella typhosa* strain 58 (the Panama carrier strain). Marketed in packages of six 2.5 cc. vials containing 1,000 million killed typhoid bacilli per cubic centimeter, suspended in physiologic solution of sodium chloride and preserved with 0.5 per cent phenol.

**NICOTINIC ACID** (See New and Nonofficial Remedies, 1940, p. 524).

The following dosage forms have been accepted:

*Tablets Nicotinic Acid, 50 mg.*  
Prepared by Endo Products, Inc., Richmond Hill, N. Y.  
*Tablets Nicotinic Acid, 100 mg.*  
Prepared by Endo Products, Inc., Richmond Hill, N. Y.

**SULFAPYRIDINE** (See New and Nonofficial Remedies, 1940, p. 494).

The following product has been accepted:

**Sulfapyridine-Smith-Dorsey**.—A brand of sulfapyridine-N. N. R.

Distributed by the Smith-Dorsey Company, Lincoln, Neb. No U. S. patent or trademark.

*Tablets Sulfapyridine-Smith-Dorsey, 0.5 Gm. (7.7 grains).*

**Council on Foods and Nutrition**

## ACCEPTED FOODS

THE FOLLOWING ADDITIONAL FOODS HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO ACCEPTED FOODS.

FRANKLIN C. BING, Secretary.

**PREPARATIONS USED IN THE FEEDING OF INFANTS, Fruits, Vegetables and other Preparations** (See Accepted Foods, 1939, p. 185).

R. H. Macy & Company, New York.

**Macy's Lily White Brand Chopped Beets.**

*Analysis* (submitted by manufacturer).—Moisture 90.3%, total solids 9.7%, ash (including sodium chloride) 0.7%, sodium chloride 0.3%, fat (ether extract) 0.2%, protein (N  $\times$  6.25) 0.7%, crude fiber 0.6%, carbohydrates other than crude fiber 7.5%, calcium (Ca) 0.022%, phosphorus (P) 0.014%, iron (Fe) 0.0010%, manganese (Mn) 0.0005%, copper (Cu) 0.00006%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 16.1.

*Calories*.—0.35 per gram; 9.9 per ounce.

**Macy's Lily White Brand Chopped Carrots.**

*Analysis* (submitted by manufacturer).—Moisture 93.7%, total solids 6.3%, ash (including sodium chloride) 0.6%, sodium chloride 0.2%, fat (ether extract) 0.4%, protein (N  $\times$  6.25) 0.5%, crude fiber 0.6%, carbohydrates other than crude fiber 4.2%, calcium (Ca) 0.029%, phosphorus (P) 0.023%, iron (Fe) 0.0008%, manganese (Mn) 0.0004%, copper (Cu) 0.00004%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 15.3.

*Calories*.—0.22 per gram; 6.2 per ounce.

**Macy's Lily White Brand Chopped Green Beans.**

*Analysis* (submitted by manufacturer).—Moisture 93.0%, total solids 7.0%, ash (including sodium chloride) 0.7%, sodium chloride 0.3%, fat (ether extract) 0.7%, protein (N  $\times$  6.25) 1.1%, crude fiber 0.8%, carbohydrates other than crude fiber 3.7%, calcium (Ca) 0.029%, phosphorus (P) 0.041%, iron (Fe) 0.0010%, manganese (Mn) 0.0002%, copper (Cu) 0.00010%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 15.4.

*Calories*.—0.26 per gram; 7.8 per ounce.

**Macy's Lily White Brand Chopped Spinach.**

*Analysis* (submitted by manufacturer).—Moisture 94.4%, total solids 5.6%, ash (including sodium chloride) 1.4%, sodium chloride 0.7%, fat (ether extract) 0.5%, protein (N  $\times$  6.25) 1.1%, crude fiber 0.8%, carbohydrates other than crude fiber 1.8%, calcium (Ca) 0.140%, phosphorus (P) 0.020%, iron (Fe) 0.0030%, manganese (Mn) 0.0006%, copper (Cu) 0.00012%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 18.1.

*Calories*.—0.16 per gram; 4.54 per ounce.

**Macy's Lily White Brand Chopped Prunes.**

*Analysis* (submitted by manufacturer).—Moisture 71.5%, total solids 28.5%, ash (including sodium chloride) 0.7%, sodium chloride 0.02%, fat (ether extract) 1.9%, protein (N  $\times$  6.25) 0.7%, crude fiber 0.6%, carbohydrates other than crude fiber 24.6%, calcium (Ca) 0.024%, phosphorus (P) 0.030%, iron (Fe) 0.0025%, manganese (Mn) 0.0002%, copper (Cu) 0.00033%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 13.7.

*Calories*.—1.18 per gram; 33.5 per ounce.

**Macy's Lily White Brand Chopped Liver Soup with Vegetables and Cereal**, canned chopped mixture of fresh beef livers, tomato juice, potatoes, carrots, unpolished rice, water, whole grain barley, celery, cabbage, barley flour, rice flour and salt.

*Analysis* (submitted by manufacturer).—Moisture 85.4%, total solids 14.6%, ash (including sodium chloride) 1.6%, sodium chloride 1.1%, fat (ether extract) 0.4%, protein (N  $\times$  6.25) 2.9%, crude fiber 0.3%, carbohydrates other than crude fiber 10.5%, calcium (Ca) 0.014%, phosphorus (P) 0.060%, iron (Fe) 0.0008%, manganese (Mn) 0.0003%, copper (Cu) 0.00047%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 8.8.

*Calories*.—0.53 per gram; 15.1 per ounce.

**Macy's Lily White Brand Chopped Vegetable Soup with Beef Broth and Cereal**, canned chopped mixture of tomato juice, beef broth, potatoes, carrots, unpolished rice, whole grain barley, celery, water, barley flour, rice flour, cabbage, salt and spinach.

*Analysis* (submitted by manufacturer).—Moisture 85.8%, total solids 14.2%, ash (including sodium chloride) 1.6%, sodium chloride 1.2%, fat (ether extract) 0.3%, protein (N  $\times$  6.25) 1.5%, crude fiber 0.3%, carbohydrates other than crude fiber 10.5%, calcium (Ca) 0.014%, phosphorus (P) 0.033%, iron (Fe) 0.0015%, manganese (Mn) 0.0003%, copper (Cu) 0.00012%, alkalinity number of salt-free ash (cc. N/1 HCl per gram ash) 10.8.

*Calories*.—0.51 per gram; 14.5 per ounce.

**UNCLASSIFIED AND MISCELLANEOUS FOODS** (See Accepted Foods, 1939, p. 351).

Chr. Hansen's Laboratory, Inc., Little Falls, N. Y.

**Junket Brand Rennet Powder, Maple Flavor**, consisting of sugar, arrowroot starch, flavor, calcium salt, rennet enzyme, with U. S. certified color added.

*Analysis* (submitted by manufacturer).—Moisture 0.8%, total solids 99.2%, ash 0.5%, fat (ether extract) 0.1%, protein (N  $\times$  6.25) 0.2%, sucrose 96.0%, starch (arrowroot) 1.5%, undetermined 0.9%.

*Calories*.—3.9 per gram; 111 per ounce.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

535 NORTH DEARBORN STREET - - - CHICAGO, ILL.

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SATURDAY, JUNE 21, 1941

## STRIKES IN HOSPITALS

Recently Pittsburgh and Allegheny County in Pennsylvania have been subjected to an extraordinary manifestation in medical affairs: a strike among hospital workers associated with Local Union No. 255 of the State, County and Municipal Workers of America, affiliated with the Congress of Industrial Organizations. Activities included picketing, demonstrations, interference with the removal of patients who wanted to use taxicabs, and interference with the receipt of food and the removal of garbage. In a strike called at the West Penn Hospital on April 18, maids, orderlies and employees in the nurses' home, in the engineering division and in the garages were called out; there were threats of violence, actual violence and establishing of picket lines. The window of an ambulance leaving the hospital was smashed and, altogether, a serious situation was created affecting the lives and health of all the patients in the hospital. On April 19 a court of Allegheny County granted an injunction restraining the defendant and its members from interfering with, hindering or obstructing the conduct and operation of the West Penn Hospital. Previously THE JOURNAL has referred to a decision by the Supreme Court of the State of Pennsylvania, which said on Jan. 6, 1941:

A hospital is not an industry. It has not been the custom in the past to unionize hospitals. The effect of unionization and attendant efforts to enforce demands would involve results far more sweeping and drastic than mere property rights.

The questions of profits for the employer or wages for the employees are not alone involved. It is not merely a matter of suspending operations, ceasing work and stopping production, such as might be true in a steel mill or automobile factory. It is a question of protecting the health, safety and, in many cases, the very lives of those persons who need the service a hospital is organized to render.

Our government, through the President, has used the United States Army to put into operation an industry conceived to be necessary in the national defense emergency. The patients in a hospital are there in almost every instance because of conditions which constitute an emergency of another kind. Many of them

are recovering from surgical operations; some of them are mothers who have given birth recently to children or who are about to give birth to children; some of them are little children who are being treated for serious conditions, including infectious diseases. The Supreme Court of the State of Pennsylvania was well advised when it said "a hospital is not an industry" and when it intimated that the use of the strike to enforce demands would involve "results far more sweeping and drastic than mere property rights." Recently a member in Congress arose to inquire why the violators of the law in the state of Pennsylvania were not prosecuted by the proper authorities of that state. Certainly here is a situation in which every power that the state possesses should be applied to protect the thousands of patients in the hospitals of Pittsburgh. Can it be that the state authorities are unwilling or incompetent to give these sick the protection that is their right?

Every one of the hospitals concerned is a nonprofit, public, charitable corporation. Not one of these hospitals is engaged in any trade or business, regardless of the point of view that has occasionally been expressed by some government officials. The concept that medicine is a trade and that the work of the hospital is a business is certain to lead to exactly the type of abuse which has developed in the state of Pennsylvania. Inevitably it will break down the morals and standards which have been applied to the care of the sick since time immemorial. In every religion held sacred by man the care of the sick is held to be a spiritual task. The type of savagery that permits leaders of labor to carry coercive technics into the work of the hospital may involve a responsibility that reaches high in the government not only of the state of Pennsylvania but also of the United States.

## IRRADIATED ANTIVIRAL VACCINES

Recently Salk and his co-workers<sup>1</sup> of the Department of Bacteriology, New York University College of Medicine, have claimed that by proper adjustment of distance, intensity and length of exposure to ultraviolet radiation a nonviable influenza vaccine may be prepared which has proved to be a fully effective prophylactic agent for laboratory animals.

Following the discovery of ultramicroscopic viruses it was hoped that, by the use of heat-killed viruses or of viruses inactivated by chemical antiseptics, prophylactic vaccines might be prepared that would be effective against all virus diseases. Soon it became evident, however, that physically or chemically inactivated viruses are usually so altered in their biochemical properties as to be practically useless as immunizing agents. Applying newer methods of antigenic titration, for example, Webster and Casals<sup>2</sup> found that of forty-one commer-

1. Salk, J. E.; Lavin, G. I., and Francis, Thomas, Jr.: *J. Exper. Med.* 72: 729 (Dec.) 1940.

2. Webster, Leslie T.: *J. Exper. Med.* 70: 87 (July) 1939. Webster, L. T., and Casals, J.: *J. Exper. Med.* 71: 719 (May) 1940.

cially available phenolized or chloroformed antirabic vaccines only eleven were of predictable clinical value; indeed, 75 per cent of their chemically inactivated viruses were without demonstrable immunizing power for mice. Tested on dogs, 50 per cent of the commercially available chloroformized vaccines were without demonstrable value. Over 90 per cent of the phenolized vaccines were antigenically inert. These percentages were recorded not only with vaccines prepared by nine different commercial firms but with different batches prepared by the same firm.

Because of evident difficulties in preparing chemically inactivated vaccines of predictable clinical value, the Rockefeller Institute bacteriologists<sup>3</sup> turned to the possibility of the successful preparation of nonviable antiviral vaccines by the use of ultraviolet radiation. When a rabies virus, for example, is exposed to a mercury vapor lamp under arbitrary standard conditions its virulence is gradually decreased, and it becomes completely noninfectious for mice by the end of about forty-five minutes. Mice repeatedly injected intraperitoneally with such nonviable irradiated vaccines usually acquire a specific immunity sufficient to resist a subsequent intracerebral injection of from 100 to 1,000 minimum lethal doses of the homologous living virus. This is in the neighborhood of ten times the average immunizing potency of the best chloroformized antirabic vaccine now available on the American market and nearly five hundred times the average immunizing potency of available phenolized vaccines.

Encouraged by these results, Salk and his co-workers applied a similar technic to the preparation of nonviable influenza vaccines. Two highly virulent strains of the virus of epidemic influenza were studied by the New York investigators; both viruses usually gave fatal infections in mice on the intranasal instillation of 0.05 cc. of a 1:10,000,000 dilution of the standard suspension. They found that the mouse infectivity of each influenza strain is completely destroyed after from nine to thirty minutes' exposure to a mercury vapor lamp. The immunity induced in mice by relatively large doses of this irradiated vaccine was practically the same as the maximum immunity resulting from sublethal infections. Quantitative titrations, however, afterward showed that this optimum is attained only with massive doses of the vaccine. Tested in minimum or threshold concentrations the irradiated vaccines were only about 1 per cent as effective as the same dose of the living virus. This discrepancy conceivably might be explained on the assumption that the living virus multiplies a hundred fold in the injected tissue before being inhibited by the immunizing process.

These encouraging results have stimulated a study of the possible application of the irradiation technics to the

preparation of nonviable poliomyelitis vaccine and to the specific prophylaxis of yellow fever. The antigenic potency of the new irradiated influenza vaccines, however, has not yet been tested on man.

#### CONSERVATION OF MAN POWER IN CONNECTICUT

Two important elements must be considered in any plan for widespread extension of preventive industrial medicine and surgery to factories, mines, mercantile establishments and other industrial classifications. One is the creation of a demand for such service by plants of all types and sizes, and the other is assurance of ready availability of trained personnel competent to carry out the objectives of industrial health. Much carefully planned educational effort is needed both for physicians and for industrialists. Recent practical experience suggests that at least in the initial stages these two groups may be instructed together. Evidently by such practice each is likely to gain a better appreciation of the part the other must play if any appreciable results are to occur in the reduction of lost-time disability on a basis which the average employer can and will support. The National Association of Manufacturers recently sponsored a series of industrial health clinics in a number of typical industrial communities in which both physicians and employers participated and wherein both were instructed about the dividends to be realized in health and in economic advantage under a system of industrial health supervision. Following this general pattern, the Saginaw County Medical Society in Michigan undertook a similar successful conference on its own initiative, a procedure which can be recommended for adoption by the profession in other industrial centers.

These earlier activities have been followed by an even more encouraging series of developments in Connecticut, one of the country's foremost manufacturing centers. A program of helpful cooperation has been instituted between committees on industrial health in the state medical society and the manufacturers' association of Connecticut. Both committees have felt that, in relation to the current defense effort, extension and improvement of industrial mediums is both an opportunity and an obligation. A pamphlet has been prepared and issued by these two organizations directed at physician and employer alike as a first step in broadening acquaintance with the objectives and technics of industrial medical service. In effect, every plant manager in the state is invited to discuss with this joint committee the health problems of his plant and to discover through this method the most effective solution. Accessibility to a consulting service of this character, backed by such influential organizations, is a most reassuring development and a long step toward supplying small plants with needed industrial health control. An expectable effect should be the creation of a much wider demand for competent industrial medical service based on ade-

3. Hodes, H. L.; Webster, L. T., and Lavin, G. I.: *J. Exper. Med.* 72: 437 (Oct.) 1940.



quate standards, ethically and scientifically. The Committee on Industrial Health in the Connecticut State Medical Society has already taken steps to see that physicians in that area will be in position to respond to these demands.

This example of civic and professional leadership is a proper function of the organized medical profession and a far reaching experiment in public relations. It deserves emulation by medical societies everywhere.

## Current Comment

### ANTI-GRAY HAIR VITAMIN DEFICIENCY IN FOXES

Whether or not the fox is especially susceptible to vitamin deficiency diseases may well be subject to investigation. In any event, one vitamin deficiency in these animals, called Chastek paralysis, has already been referred to in *THE JOURNAL*.<sup>1</sup> Perhaps these animals are particularly susceptible to deficiency of thiamine, for now Morgan and Simms<sup>2</sup> report observations on 6 young silver foxes, 3 of them placed on a purified diet supplemented by fish liver oil, wheat germ, riboflavin and nicotinic acid, and 3 others receiving the same diet with the addition of a yeast "filtrate factor." Of the first group, 1 died after twenty-six days and the other 2 lost most of their fur. At necropsy the fox that died and the other 2 on deficient diet, pelted four months later, showed large red mottled thymuses. The 3 foxes which received the filtrate factor retained their fur, had no surviving thymuses and had normal dark silver pelts. These observations tend to confirm previous facts noted in rats and dogs and suggest that there is a specific vitamin fraction in the B group which may be called, for the present, the anti-gray hair vitamin of foxes. No doubt the possible implication to gray hair in man will result in follow-up studies in the near future on this interesting deficiency disease in foxes.

### ENSOL IN THE NEWS

*THE JOURNAL* has previously commented<sup>1</sup> on "Ensol," a preparation advocated for cancer by Dr. Hendry C. Connell of Kingston, Ont. It was pointed out that the results claimed by the promulgator were not dissimilar to those obtained with several other methods, e. g. by Coley's fluid, by various bacterial toxins, by injection of Witte's peptone or a number of similar foreign proteins. In 1935 *THE JOURNAL* warned that grief would inevitably result from the promotion of this uncontrolled product. Three years later eleven deaths were reported in Orlando, Fla., following the use of Rex, series 152—a form of Ensol which had been contaminated with tetanus organisms. Recently the Ontario Commission for the Investigation of Cancer

Remedies made an equivocal report on the product and thereby stimulated renewed publicity. Newspaper reports seem to suggest that Ensol has been "approved" by the commission.<sup>2</sup> Because of inquiries received at the American Medical Association, a letter was sent by air mail to the commission in care of one of its members asking if the commission had issued the statements suggested. Although a month has elapsed since the mailing of this letter a reply has not yet been received. In 1935 the newspapers described Ensol as a "cancer cure"; now it is stated by Dr. Connell and the commission that they do not consider Ensol to be a "cure" but that benefit is sometimes derived from its administration. A brief comment in a recent issue of the *Canadian Medical Association Journal*<sup>3</sup> offers a more conservative attitude than is obtained by reading other journals but indicates that the commission grants Ensol has "produced beneficial results in a fairly large percentage of patients suffering from cancer." Fortunately the commission suggests that it is too early to vindicate the acceptance of Ensol in preference to other recognized procedures. Apparently the Canadian commission has "damned with faint praise." Nevertheless some patients with cancer in a stage which might be controlled by standard technic may demand the use of this doubtful product to the exclusion of more generally accepted procedures.

### PRESCRIPTIONS

When the new Federal Food, Drug and Cosmetic Act was enacted, many doubted its effectiveness. Similar consideration was given to the Wheeler-Lea Amendment to the Federal Trade Commission Act, which became a law at about the same time. Now some figures have become available which seem to indicate clearly that such legislation is having a desirable effect. The *American Journal of Pharmacy* for January 1941 contains an item under the title "The Nation Takes Its Medicine," noting that prescription drugs and medicines showed an increase of \$36,000,000 for 1939 over 1937 and that "patent" and proprietary medicines for public sale decreased \$18,000,000 in value in the same period. The actual value of the prescription medicines in 1939 was \$178,930,487. The value of "over the counter" medicines in that year was \$166,577,263. Obviously, therefore, the permissible claims for "patent medicines" today are so restricted as to reduce their sale to the public, or the public is becoming better informed as to the advantages of employing ethical remedies and prescribed remedies. The *Drug and Cosmetic Industry* for December 1940 provides an analysis in its story "Ethicals Take Lead." Apparently vitamins showed the greatest gain, glandular preparations also advanced, and the use of biologic preparations was adversely affected by the popularity of sulfanilamide in infectious conditions. Education is making the public aware of the advantage of using ethical remedies and prescribed remedies. If, by action of the various federal agencies, the sales of "patent medicines" continue to decrease, a new day will dawn for the health of the American people. The health of the nation is an integral part of national defense.

1. A Deficiency Disease in Foxes, Current Comment, *J. A. M. A.* **116**: 234 (Jan. 18) 1941.

2. Morgan, A. F., and Simms, H. D.: Anti-Gray Hair Vitamin Deficiency in the Silver Fox, *J. Nutrition* **20**: 627 (Dec.) 1940.

3. The Connell Cancer Cure, editorial, *J. A. M. A.* **105**: 1122 (Oct. 5) 1935. Deaths from Ensol-Rex Cancer Treatment and Food and Drug Legislation, *ibid.* **110**: 1288 (April 16) 1938. Eleven Deaths from a Cancer Treatment, *ibid.* **110**: 1183 (April 9) 1938.

2. Bureau of Investigation, *J. A. M. A.* **116**: 2525 (May 31) 1941.

3. News Items, *Canadian M. A. J.* **44**: 96 (Jan.) 1941.

# MEDICAL PREPAREDNESS

*In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.*

## ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY

The following additional medical reserve corps officers have been ordered to extended active duty by the War Department, Washington, D. C.:

ALPERN, Algernon Nathan, 1st Lieut., Pittsburgh.  
BASS, John Burrell, 1st Lieut., Gadsden, Ala.  
BAYON, Henry Joseph, Jr., Captain, New Orleans.  
CAPVERT, Hulin Elwin, Major, San Antonio, Texas.  
CAPPELLER, William S., 1st Lieut., San Francisco.  
CARDEY, Norman LeRoy, 1st Lieut., Winona, W. Va.  
CASAMAS, Lawrence Vito, 1st Lieut., Brooklyn.  
CHAPIN, Willard James, 1st Lieut., Perry, N. Y.  
FOX, William Morgan, 1st Lieut., Columbia, S. C.  
GLECKLER, John David, Major, San Antonio, Texas.  
GOSS, Walter Alling, Jr., 1st Lieut., Chicago.  
GRANT, Ben Ely, Major, Hollywood, Calif.  
GRIFFIN, Ernest Pierce, Jr., 1st Lieut., Valhalla, N. Y.  
HARMAN, Glen S., 1st Lieut., Santa Barbara, Calif.  
HAWLEY, Carl John, 1st Lieut., Los Angeles.  
HAYES, Dean M., 1st Lieut., Washington, D. C.  
HEYER, Howard Eugene, 1st Lieut., Chicago.

### WAR DEPARTMENT

HILL, Thurman Knight, 1st Lieut., Decatur, Ga.  
INDERLIED, Herman Frederick, 1st Lieut., Portland, Ore.  
INGALLS, George Samuel, 1st Lieut., Towson, Md.  
IPPOLITO, Thomas Leonard, 1st Lieut., Glendale, L. I., N. Y.  
JOEL, Samuel W., 1st Lieut., Washington, D. C.  
JORDAN, Paul Hartley, 1st Lieut., Ann Arbor, Mich.  
KANTHAK, Frank Folbert, 1st Lieut., Chicago.  
KATZ, Harry Leon, 1st Lieut., Cleveland.  
LEIGH, Cortland Dyal, 1st Lieut., Pittsburgh.  
MARCH, Harry Nelson, Captain, Grass Valley, Calif.  
MARSHAK, Richard H., 1st Lieut., New York.  
MARSHALL, Frank Auton, Major, Weehawken, N. J.  
MILLER, Cecil Ewing, 1st Lieut., Washington, D. C.  
NORTON, William Ignatius, 1st Lieut., Oakland, Calif.  
PRUCE, Arthur Marcel, 1st Lieut., Brooklyn.  
RIEDEL, Henry Frank, 1st Lieut., Portland, Ore.  
SCHOPP, Alvin C., 1st Lieut., Shreveport, La.  
SNYDER, Gordon Elias, 1st Lieut., New Milford, Pa.  
SULT, Charles William, Jr., 1st Lieut., Phoenix, Ariz.  
TUNICK, Arthur Mandel, 1st Lieut., New York.  
TYLER, Gilman Rackley, 1st Lieut., Richmond, Va.  
ZIMMERMAN, Richard P., 1st Lieut., Holsopple, Pa.

### FIRST CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, First Corps Area, which comprises the states of Maine, Vermont, New Hampshire, Rhode Island, Massachusetts and Connecticut:

ANDERSON, Justin L., 1st Lieut., Reading, Mass., Fort Oglethorpe, Ga.  
BISHOP, Ernest W., 1st Lieut., East Providence, R. I., Fort Oglethorpe, Ga.  
BREM, Jacob, Captain, Worcester, Mass., Maxwell Field, Ala.  
CALCAGNI, Oscar H., 1st Lieut., Morrisville, Vt., Fort Barrancas, Fla.  
FARRELL, Malcolm J., Captain, Waverley, Mass., Fort Devens, Mass.

### THIRD CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Third Corps Area, which comprises the states of Pennsylvania, Virginia, District of Columbia and Maryland:

AYERILL, Roy Samuel, 1st Lieut., Pittsburgh, Fort George G. Meade, Md.  
BARNIARDT, Russell Arthur, 1st Lieut., Pittsburgh, Carlisle Barracks, Pa.  
BASTIEN, Henry Louis, Captain, Arlington, Va., Fort Belvoir, Va.  
BUCKLAND, Wilmer Brundage, 1st Lieut., Philadelphia, Fort Eustis, Va.  
COOPER, George, Jr., 1st Lieut., University, Va., Fort Eustis, Va.  
DEAN, James Scay, Captain, Pennhurst, Pa., Fort Eustis, Va.  
DUNKELBERGER, John Alfred, 1st Lieut., Philadelphia, Fort Bragg, N. C.  
FERGUSON, Richard Butler, 1st Lieut., Baltimore, Fort Eustis, Va.  
GABRIEL, Louis Thomas, Jr., 1st Lieut., Eldred, Pa., Fort Myer, Va.  
HARTZ, William, Major, Philadelphia, Fort Belvoir, Va.

### NINTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Ninth Corps Area, which comprises the states of Washington, Montana, Oregon, Nevada, Utah, California and Idaho:

ADAMS, Julius G., 1st Lieut., Friday Harbor, Wash., 56th Medical Battalion, Fort Lewis, Wash.  
ANDLER, Maxwell M., 1st Lieut., Los Angeles, First Medical Regiment, Fort Ord, Calif.  
BARNES, Myron C., 1st Lieut., Ontario, Calif., 3d Army Corps, Presidio of Monterey, Calif.  
BARSHOP, Nathan, Captain, Los Angeles, Fort Rosecrans, Calif.  
BOSSERT, Robert H., 1st Lieut., Burbank, Calif., Camp Roberts, Calif.  
BRENNAN, John J., 1st Lieut., San Francisco, Camp Roberts, Calif.  
BROCKBANK, Mark J., 1st Lieut., Price, Ida., 41st Division, Camp Murray, Wash.  
CHERRY, Clifford R., 1st Lieut., Los Angeles, 3d Army Corps, Presidio of Monterey, Calif.  
DAMRON, Milton H., Captain, M. R. C., Huntington, Park, Calif.  
DOUGLAS, Wallace S., Captain, Lewiston, Ida., Fort Worden, Wash.  
GUARDINO, Salvador J., 1st Lieut., M. R. C., Brisbane, Calif., Station Hospital Fort Lewis, Wash.  
GUMMESS, Glen H., 1st Lieut., Los Angeles, Camp Roberts, Calif.  
GUTEKUNST, Frederic W., 1st Lieut., San Bernardino, Calif., Camp Roberts, Calif.  
HANSEN, Oscar J., 1st Lieut., Redding, Calif., 41st Division, Camp Murray, Wash.

HASLINGER, Joseph F., 1st Lieut., Portland, Ore., Station Hospital, Fort Lewis, Wash.  
 HAWKINS, Ralph L., Captain, San Francisco, Station Hospital, Fort Lewis, Wash.  
 HEIN, Walter F., Captain, Williams, Ariz., Moffett Field, Calif.  
 HOLT, C. Zeno, Colonel, Los Angeles, Reserve Officers Training Corps, University of California, San Francisco.  
 JAEKLE, Russell F., Captain, San Francisco, Camp Roberts, Calif.  
 KARLEEN, Philip E., Captain, M. R. C., Soquel, Calif., 7th Division, Fort Ord, Calif.  
 KIRCHDOERFER, Herman, 1st Lieut., Pasadena, Calif., Camp Roberts, Calif.  
 LING, Louis A., Captain, Deer Park, Wash., Northwest Air District, Fort George Wright, Wash.  
 MITCHELSON, David D. S., 1st Lieut., Los Angeles, Camp Roberts, Calif.  
 MONSERATE, Domingo N., Major, Helena, Mont., Camp San Luis Obispo, Calif.  
 NOALL, Wendell, 1st Lieut., Ogden, Utah, 41st Division, Camp Murray, Wash.  
 PAWLEY, Ralph E., 1st Lieut., Indio, Calif., Camp Callan, Calif.  
 PERELSON, Harold N., 1st Lieut., Huntington Park, Calif., Camp Callan, Calif.

PEREZ, Eugene R., 1st Lieut., San Francisco, Camp Roberts, Calif.  
 PROFFITT, Josiah C., Captain, Seattle, Station Hospital, Fort Lewis, Wash.  
 RICHARDS, Ezra E., 1st Lieut., M. R. C., Burlingame, Calif., 7th Division, Fort Ord, Calif.  
 ROSE, William D., 1st Lieut., M. R. C., San Francisco, Camp Roberts, Calif.  
 ROVANE, John W., 1st Lieut., M. R. C., Poodland, Calif., Camp Roberts, Calif.  
 SASLAW, Lewis B., Captain, Stockton, Calif., Camp Roberts, Calif.  
 SELIGMAN, Lewis L., Captain, Dinuba, Calif., Fort Lewis, Wash., duty with Medical Service Troops.  
 SORENSON, Edward J., 1st Lieut., Beverly Hills, Calif., Corps Area Service Command, Fort Ord, Calif.  
 STUPPY, Laurence J., 1st Lieut., Hollywood, Calif., Southern California Recruiting District, Los Angeles.  
 SULLIVAN, James M., Major, San Francisco, Camp Roberts, Calif.  
 WALL, Edward C., 1st Lieut., Prineville, Ore., 155th Station Hospital, Camp Roberts, Calif.  
 WESSELL, Maurice S., Captain, Hamilton, Mont., Fort Worden, Wash.  
 WESTERHOUT, Charles E., Captain, Brea, Calif., 3d Army Corps, Presidio of Monterey, Calif.

### ORDERED TO FOREIGN DUTY

BURNETT, Thomas Raynes, Major, Mission, Texas, Dutch Harbor, Alaska.  
 BYARS, Perry J. C., Jr., 1st Lieut., M. R. C., Lampasas, Texas, to Schofield Barracks, Honolulu, Hawaii.  
 EISNER, David George, 1st Lieut., M. R. C., Cleveland, to Station Hospital, Fort Buchanan, San Juan, Puerto Rico.  
 EPERJESSY, Ernest Zoltan, 1st Lieut., Johnstown, Pa., Fort Amador, Balboa, Canal Zone.  
 KENNEDY, Richard Loren, 1st Lieut., West Lafayette, Ind., Ponce Air Base, Ponce, Puerto Rico.  
 KNESE, Luke Ambrose, Captain, M. R. C., Billings, Mont., to Tripler General Hospital, Honolulu, Hawaii.  
 KOSTECKI, Walter Andrew, 1st Lieut., South Hanson, Mass., Sternberg General Hospital, Manila, Philippine Islands.  
 LEASUM, Charles, 1st Lieut., Sturgeon Bay, Wis., 12th Medical Regiment, Fort William McKinley, Philippine Islands.

LITTER, Leo, 1st Lieut., M. R. C., New York, to Station Hospital, Fort Buchanan, San Juan, Puerto Rico.  
 MILLER, Edward Simpson, 1st Lieut., M. R. C., Murphy, N. C., to Philippine Department, Fort Santiago, Manila, Philippine Islands.  
 PAUL, William Gordon, 1st Lieut., M. R. C., Durant, Okla., to Station Hospital, Fort Richardson, Anchorage, Alaska.  
 RININGER, Harold Casper, 1st Lieut., Rockport, Ind., Station Hospital, Fort Clayton, Canal Zone.  
 SANJURJO RAMIREZ, Luis Arturo, 1st Lieut., M. R. C., San Juan, Puerto Rico, to Station Hospital, San Juan, Puerto Rico.  
 SCHAUMLOFFEL, Roland Abraham, 1st Lieut., M. R. C., Los Angeles, to Ketchikan, Alaska.  
 STERN, Siegfried, 1st Lieut., M. R. C., New Rochelle, N. Y., to Borinquen Field, Puerto Rico.  
 STRAND, Clarence Johnson, Captain, M. R. C., Amherst, Neb., to Sternberg General Hospital, Manila, Philippine Islands.

### SENIOR AND JUNIOR STUDENTS MAY BE COMMISSIONED IN ADMINISTRATIVE CORPS

The War Department has granted authority for male junior and senior medical students in grade A medical schools in the United States to be commissioned second lieutenants in the Medical Administrative Corps Reserve after July 1. Interns may be commissioned first lieutenants in the medical corps reserve with the understanding that they will be ordered to a year's active duty immediately after completing their internships. The granting of commissions to junior and senior students will exempt them from selective training and service and permit them to complete their medical education which might otherwise be interrupted; likewise, interns will be relieved of the possible interruption of their training. Students and interns who are properly qualified will be invited to submit applications for appointment, final approval in each case to be made by the War Department. Further instructions regarding the procedure to be followed will shortly be published.

### GENERAL LOVE TO RETIRE

The War Department today announced that Brig. Gen. Albert G. Love, M. C., on duty in Washington, D. C., as assistant to the Surgeon General, would retire from active service on July 31 on account of reaching the statutory retirement age. His temporary appointment as brigadier general will be terminated on July 16, at which time he will revert to his permanent rank of colonel.

General Love was born in Trezevant, Tenn., and graduated from the University of Mississippi. He received his medical degree from the Memphis Hospital Medical College in 1904 and served a year as an intern in the U. S. Public Health Service. He then served as a contract surgeon in the United States Army from 1905 to 1906, after which he was appointed a first lieutenant in the medical corps of the regular army.

Prior to the World War General Love served as surgeon at various points in the United States, the Philippine Islands and Alaska. During and subsequent to the World War he was

head of the Statistical Division in the Office of the Surgeon General, Washington, D. C. He prepared a medical history of the World War and published detailed statistical studies of war casualties. Since 1938 he has been chief of the Planning and Training Division in the Office of the Surgeon General.

### GRADUATION OF STUDENT OFFICERS AT CARLISLE BARRACKS

Another class of 538 student officers of the various corps of the medical department of the army, including members of the Regular Army, the National Guard and the Reserves, graduated May 29 at the Medical Field Service School at Carlisle Barracks and were ordered returned to their various units throughout the country. This was the fifth refresher class of student officers to graduate recently at this school following a course which has been necessarily shortened because of the present emergency. General Addison B. Davis, who has recently been made assistant to the surgeon general, in presenting the diplomas to the graduates pointed out that the demand for trained medical department officers is urgent and is increasing in magnitude.

### PROMOTION OF COLONELS DAVIS AND McAFEE

President Roosevelt has nominated Col. Addison D. Davis, M. C., to be assistant to the Surgeon General for four years, with rank of brigadier general, vice Brig. Gen. Roger Brooke, and Col. Larry B. McAfee, M. C., to be assistant to the Surgeon General for four years, with rank of brigadier general, vice Brig. Gen. Raymond F. Metcalfe.

### NEW GARMENTS FOR PATIENTS

A maroon colored garment for patients in army hospitals has been approved, it is reported, replacing the former drab garments. In addition to the more cheerful aspect, the new garments are handy for the patients while they are convalescing, as there are no buttons on the robes and they have side pockets to carry personal items.

# ORGANIZATION SECTION

## PROCEEDINGS OF THE CLEVELAND SESSION

MINUTES OF THE NINETY-SECOND ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION, HELD IN CLEVELAND, JUNE 2-6, 1941

### HOUSE OF DELEGATES

#### *Second Meeting—Tuesday Morning, June 3*

The House of Delegates was called to order at 9:45 a. m. by the Speaker, Dr. H. H. Shoulders.

#### Roll Call

On motion of Dr. Arthur T. McCormack, Kentucky, seconded by Dr. Walter E. Vest, West Virginia, and carried, the House dispensed with the roll call.

#### Presentation of Minutes

Dr. Arthur T. McCormack, Kentucky, moved that the House dispense with the reading of the minutes. The motion was seconded by Dr. John Z. Brown, Utah, and carried.

#### Report of Reference Committee on Credentials

Dr. G. Henry Mundt, Chairman, reported that one hundred and sixty-four delegates had registered and been seated. He asked approval of the House of Delegates for the action of the reference committee in seating the assistant secretary of the Rhode Island Medical Society in the absence of the regularly elected delegate and alternate, and in seating a delegate designated by the president of the South Carolina Medical Association because of the absence of a regularly elected delegate of that association and his regularly elected alternate.

On motion of Dr. Edward M. Pallette, California, seconded by Drs. Arthur J. Bedell, Section on Ophthalmology, and Arthur T. McCormack, Kentucky, and carried, the House approved of the action of the reference committee in seating the assistant secretary of the Rhode Island Medical Society.

The action of the reference committee in seating the one designated by the president of the South Carolina Medical Association was approved on motion of Dr. E. G. Wood, Tennessee, seconded by Dr. Walter E. Vest, West Virginia, and carried after discussion by Drs. Arthur T. McCormack, Kentucky, and Olin West, Secretary.

#### Report of Committee on Medical Preparedness

Dr. Irvin Abell, Chairman, presented the following report, which was referred to the Reference Committee on Executive Session:

REPORT OF THE COMMITTEE ON MEDICAL PREPAREDNESS  
*To the Members of the House of Delegates of the American Medical Association:*

At the annual session of the American Medical Association held in New York, June 10 to 14, 1940 the Board of Trustees submitted to the House of Delegates at its first meeting on June 10 resolutions providing for the appointment of a Committee on Medical Preparedness which, when created, should "establish and maintain contact and suitable relationship with all governmental agencies concerned with the prevention of disease and the care of the sick, in both civil and military aspects, so as to make available at the earliest possible moment every facility that the American Medical Association can offer for the health and safety of the American people and the maintenance of American democracy." At the same meeting of the House of Delegates, Lieut. Col. George C. Dunham, member of the House representing the Medical Corps of the United States Army, submitted a "tentative plan for the pro-

curement of professional personnel for the Medical Corps of the Army in the event of a national emergency."

The resolutions of the Board of Trustees and the statement submitted by Colonel Dunham were referred to the Reference Committee on Executive Session. The reference committee reported to the House of Delegates in executive session on Tuesday, June 11, and recommended that the resolutions submitted by the Board of Trustees be amended to include the Chairman of the Board as a member ex officio of the proposed Committee on Medical Preparedness, and that the Committee should be appointed by the Speaker of the House. The resolutions with the amendments offered were adopted by the House of Delegates. At a later meeting of the House of Delegates the Reference Committee on Executive Session presented a second report in which it was recommended that the Committee on Medical Preparedness be composed of ten members of the House of Delegates with the President of the Association, the Chairman of the Board of Trustees, the Secretary of the Association, the Secretary of the Board of Trustees and the Editor of THE JOURNAL as members ex officio. The recommendations of the reference committee were adopted by the House, and the Committee on Medical Preparedness was duly appointed on June 13, 1940.

#### MEETINGS OF THE COMMITTEE

The first meeting of the Committee was held immediately after adjournment of the House of Delegates on June 13, 1940. Other meetings were held July 19, Sept. 20 and Nov. 23, 1940 and Feb. 15, 1941. At these meetings the Medical Corps of the United States Army, the Medical Corps of the United States Navy and the United States Public Health Service have been officially represented, and the representatives of these government services have been most gracious and generous in extending aid to the Committee. The Selective Service System was represented at two meetings by Lieut. Col. Charles B. Spruit, who offered information and counsel of the most helpful nature. At the meeting held on Feb. 15, 1941 the members of the Subcommittee on Medical Education of the Health and Medical Committee of the Federal Security Agency were present, as were members of the Council on Medical Education and Hospitals.

#### CONFERENCE ON MEDICAL PREPAREDNESS

On Sept. 20, 1940 a conference was held under the auspices of this committee at the Association's offices in Chicago. This conference was attended by the state chairmen of the Committee on Medical Preparedness from forty-five states and the District of Columbia and by representatives of two state chairmen who could not themselves attend because of illness. There were also present official representatives of the Medical Corps of the Army and of the Navy, the United States Public Health Service and the Selective Service System, members of the Board of Trustees of the American Medical Association and several members of official personnel of constituent state medical associations.

#### CONFERENCES WITH GOVERNMENT OFFICIALS

On numerous occasions representatives of this committee have conferred in Washington, D. C., or at the Association's offices with government officials concerned with various phases of the national defense program. Individual members of the Committee have maintained official contact with Corps Area Surgeons in their respective areas and have attempted to be as helpful as possible to these most important officers.

## STATE CHAIRMEN AND STATE AND COUNTY COMMITTEES

As soon as possible after the creation of the Committee on Medical Preparedness, each constituent association was requested to select some one of its members to serve as state chairman of the Committee. This request was promptly complied with, and a splendid group was quickly organized to represent the Committee in the major political divisions of the United States. The state chairmen have rendered invaluable service, without which it would have been impossible for this Committee to perform many of the duties assigned to it by the House of Delegates.

Constituent state medical associations and many component county and district medical societies have organized preparedness committees, and these have contributed splendidly to the success that has thus far been attained in the major undertakings of this Committee and its state chairmen.

## SURVEY OF MEDICAL PERSONNEL

The major task assigned to the Committee by the House of Delegates involved an attempt to make a complete survey of medical personnel of the nation to determine the number of physicians available for service in various capacities and to develop facts that would be useful in aiding the profession to render the greatest possible service in any national emergency that might develop.

Among the objectives which the Committee hopes and expects to attain as fully as possible through this nationwide survey are (1) the number of physicians licensed to practice medicine, (2) the number capacitated for active service and the number of those incapacitated, (3) the number and location of physicians who may be qualified and available for service with the military forces of the nation and for other essential governmental services in case of national emergency, (4) the number available for service to the civilian population under emergency conditions, (5) the availability and qualifications of those who can serve acceptably in special fields of medicine, (6) the number and identity of physicians qualified for teaching and research who are believed to be essential for the proper maintenance of educational institutions and (7) the number and identity of physicians already engaged in government services.

## QUESTIONNAIRES FOR SURVEY PURPOSES

For the purposes of a survey of such extensive and intensive nature, it was essential that information should be secured from the individual physician, and a questionnaire was prepared and submitted for criticism and suggestion to various qualified persons including the Surgeon General of each of three medical services of the federal government. It was not possible to include in the questionnaire all the items suggested since to do so would have necessitated the use of two cards for each physician and would have seriously retarded the compilation of data.

When the questionnaire was finally approved and prepared for distribution, a copy was sent with explanatory statements to every physician in the United States, its territories and possessions whose names and addresses were available. There is a surprisingly large movement of physicians even under normal conditions. The first mailings were made at a time of year when there were many changes of address, and consequently there was some delay in getting the schedules into the hands of some physicians. The total number of questionnaires distributed is in excess of 180,000, of which 150,407, or 82.9 per cent, had been filled in and returned by physicians in the United States as of April 1, 1941. Of the physicians in the territories and possessions, 1,571 have returned their questionnaires as of April 1, 1941, a return of 31.7 per cent.

While completed questionnaires are still being received, it may be that the total number of returns will not be greatly increased. Some physicians have mislaid the forms received or have been careless about returning them, and some because they are already engaged in government service or because they have retired or are incapacitated have assumed that it is not necessary to return the questionnaires. Others have perhaps failed to receive the schedules because of changes of address. A few have refused to cooperate in the survey.

It is highly important that every physician in the nation participate in this survey, through which an opportunity is

offered to compile data of the greatest immediate importance as well as of great historical value. If the information secured is properly utilized, it should be possible to provide necessary medical service for the military forces now on duty and for expanded forces in case of deepened emergencies with the least possible interference with the needs of the civilian population and of those of essential medical institutions.

## COMPILATION OF DATA

The duty of collecting and compiling data secured through the survey was assigned by the Board of Trustees to the Bureau of Medical Economics. Practically every department in the offices of the Association has actively participated in promoting the work of the Committee on Medical Preparedness. Moreover, several independent scientific organizations have graciously offered cooperation, and their official representatives have rendered invaluable aid in various ways.

Questionnaires returned by individual physicians have been checked and edited as rapidly as possible for the purpose of transferring data to punch cards so that information can be readily provided, on demand, for the use of official agencies and for other essential purposes. For some time after the survey was initiated, it was necessary to "query" about 40 per cent of the questionnaires returned in order to secure more complete and more accurate data. On April 1 of the current year 138,263 punch cards had been prepared, and the process will be continued until fully completed.

## SPECIAL LISTINGS

Listings of various groups in the profession have been partially prepared, and these will be completed when all questionnaires returned have been properly checked and available data transferred to punch cards.

The first listing was of general practitioners. From the available punch cards, arranged according to type of practice, it appears that 55,811 physicians are in general practice and that 78,960 devote special attention to some type of limited practice. Data obtained from 95,000 punch cards show that 12,604 physicians reported that they held commissions in medical corps. Of this number, 812 are members of the Medical Corps and 9,126 of the Medical Reserve Corps of the Army; 443 are members of the Medical Corps and 990 of the Medical Reserve Corps of the Navy; 789 are members of the Medical Corps of the National Guard, and 444 are officers of the Public Health Service. Additions are constantly being made to the Medical Reserve Corps and an unknown number of commissioned officers have resigned, so that, as this report is being prepared, the present strength is not known to the Committee on Medical Preparedness.

Listings of specialists in various fields of medicine have been made, and the Committee has received from organizations composed of specialists most valuable aid in an attempt to determine the availability and qualifications for special services.

An effort has been made to determine the number and locations of physicians qualified to serve in the field of industrial health, and the Council on Industrial Health has cooperated in this undertaking. A special questionnaire for this purpose was sent to 10,158 physicians, and 6,472 of these have been returned. As far as can be determined from available data, 1,177 physicians devote their full time to activities of various kinds in this particular field, 1,438 give more than half their time and 1,471 devote less than half their time to some phase of industrial health.

Other special listings are in course of preparation, including those pertaining to health officers and associated personnel, women physicians, incapacitated physicians and other groups.

ASSISTANCE OF THE AMERICAN MEDICAL ASSOCIATION IN  
CLASSIFICATION AND PROCUREMENT OF PHYSICIANS  
FOR MILITARY SERVICE

The Adjutant General of the Army has sent the following instructions to the Surgeon General and to each corps area and department commander:

1. The following plan has been approved and will be placed in operation at such time as the War Department may direct.

(a) The American Medical Association will prepare and maintain a roster of civilian physicians, classified as to profes-



## Statistical Report, Census of Physicians, as of April 1, 1941

States by Corps Areas		Number of Physicians A. M. Directory June 1, 1940	New Names Added to April 1, 1941	Total Number of Physicians as of April 1, 1941	Number of Schedules Received as of April 1, 1941	Per Cent of Schedules Received April 1, 1941	Schedules Yet to Come *	Incomplete Schedules †	Number of Physicians Reported De- ceased Since June 1940
I	Connecticut.....	2,593	115	2,713	2,334	86.0	233	96	38
	Maine.....	992	18	1,010	819	81.1	128	63	29
	Massachusetts.....	7,889	317	8,206	5,632	68.6	2,193	381	138
	New Hampshire.....	656	9	665	600 <sup>5</sup>	99.2	27	27	16
	Rhode Island.....	961	18	979	858	87.6	94	27	12
	Vermont.....	523	8	531	516	97.2	8	7	11
	Total.....	13,619	485	14,104	10,819	76.7	2,706	601	244
II	Delaware.....	339	19	358	297	83.0	56	5	5
	New Jersey.....	5,813	257	6,070	4,647	76.6	1,288	135	80
	New York.....	27,596	1,015	28,411	23,500	79.5	5,141	680	336
	Total.....	33,548	1,291	34,839	27,534	79.0	6,485	820	421
III	District of Columbia.....	2,243	116	2,359	1,332	56.5	920	167	30
	Maryland.....	2,983	178	3,166	3,060	96.7	70	56	42
	Pennsylvania.....	13,529	525	14,064	10,615	75.5	3,013	436	258
	Virginia.....	2,889	62	2,951	2,506	84.9	364	81	70
	Total.....	21,649	891	22,540	17,513	77.7	4,367	660	400
IV	Alabama.....	2,075	31	2,106	2,132 <sup>1</sup>	100.0	...	...	62
	Florida.....	2,276	23	2,304	2,215 <sup>2</sup>	96.1	...	127	67
	Georgia.....	2,825	78	2,903	2,397	82.6	505	1	77
	Louisiana.....	2,464	234	2,698	1,990	73.8	615	63	57
	Mississippi.....	1,497	4	1,501	1,313	87.5	155	33	40
	North Carolina.....	2,740	47	2,787	2,083	74.7	632	72	58
	South Carolina.....	1,402	32	1,434	1,329	92.7	63	47	32
	Tennessee.....	2,903	103	3,011	2,426	80.6	485	100	80
	Total.....	18,187	587	18,744	15,885	84.7	2,480	443	473
V	Indiana.....	4,132	117	4,249	4,013	94.4	142	94	97
	Kentucky.....	2,761	54	2,815	2,802 <sup>4</sup>	99.5	...	25	68
	Ohio.....	9,318	324	9,642	8,545	88.6	762	335	183
	West Virginia.....	1,834	29	1,863	1,576	84.6	239	48	38
	Total.....	18,045	524	18,569	16,936	91.2	1,143	502	386
VI	Illinois.....	12,183	495	12,683	10,211	80.5	1,988	484	246
	".....	6,362	251	6,613	5,070	76.7	1,341	202	114
	".....	3,523	98	3,621	2,772	76.6	728	121	61
	Total.....	22,073	844	22,917	18,053	78.8	4,057	607	421
VII	Arkansas.....	1,829	26	1,855	1,783	96.1	30	42	89
	Iowa.....	3,084	48	3,132	3,102	99.0	21	0	63
	Kansas.....	2,070	38	2,108	1,813	86.0	166	139	34
	Minnesota.....	3,527	122	3,649	3,360	92.1	217	42	46
	Missouri.....	5,297	228	5,525	4,562	82.6	721	242	136
	Nebraska.....	1,633	41	1,676	1,568	93.6	108	...	33
	North Dakota.....	518	9	527	490	93.0	23	0	9
	South Dakota.....	503	2	510	515 <sup>6</sup>	100.0	...	...	9
	Wyoming.....	274	1	275	261	94.9	8	6	5
	Total.....	18,742	515	19,257	17,454	90.6	1,319	489	394
VIII	Arizona.....	594	13	607	611 <sup>2</sup>	100.0	...	1	6
	".....	1,964	54	2,018	1,719	85.2	31	263	39
	".....	439	2	441	383	88.0	47	6	6
	".....	2,352	26	2,378	2,142	90.1	153	83	51
	Total.....	6,893	158	7,056	5,843	82.8	783	480	172
IX	Alaska.....	74	...	74	55	74.3	19	...	...
	California.....	11,909	390	12,299	10,480	85.2	1,374	445	218
	Idaho.....	423	6	429	382	89.0	23	9	8
	Montana.....	537	10	547	477	87.2	51	19	16
	Nevada.....	167	1	168	121	72.0	36	11	3
	Oregon.....	1,461	35	1,496	1,383	92.8	108	...	23
	Utah.....	575	22	597	532	89.1	55	10	0
	Washington.....	2,200	71	2,271	2,075	91.4	165	31	25
	Total.....	17,346	535	17,881	15,510	86.7	1,816	525	317
Total for United States.....		175,456	5,895	181,351	150,407 <sup>7</sup>	82.9	25,367	5,685	3,330
Canal Zone.....		216	15	231	140	60.6	91	...	1
Hawaii.....		455	6	461	324	70.3	137	...	6
".....		3,445	300	3,745	891	21.4	2,914	...	18
".....		473	12	485	399	61.9	185	...	1
".....		30	...	30	6	20.0	24	...	...
Total.....		4,619	333	4,952	1,571	31.7	3,391	...	26
Grand total.....		180,075	6,228	186,303	151,978 <sup>7</sup>	81.6	28,748	5,685	3,356

1. 26 schedules apparently forwarded from Alabama but which probably should have been credited to other states.

2. 5 schedules apparently forwarded from Arizona but which probably should have been credited to other states.

3. 38 schedules apparently forwarded from Florida but which probably should have been credited to other states.

4. 12 schedules apparently forwarded from Kentucky but which probably should have been credited to other states.

5. 22 schedules apparently forwarded from New Hampshire but which probably should have been credited to other states.

6. 5 schedules apparently forwarded from South Dakota but which probably should have been credited to other states.

7. This figure includes the summation of notes 1 to 6 as they should be spread over the entire country.

\* Figures in this column change constantly with the addition of new names and the movement of physicians from one state to another.

† The numbers in this column represent the schedules for which only incomplete information could be secured either by the State Medical Preparedness Committee or from the American Medical Directory. These schedules were prepared, with the information available, for some physicians who because of age, physical condition or other reasons did not file a schedule themselves.

sional specialties and proficiency, who have agreed to accept commissions in the Army of the United States when needed for immediate active duty during a national emergency.

(b) The Surgeon General will designate one or more medical officers of the Regular Army who will be placed on duty at Headquarters, Sixth Corps Area, as representatives of his office in all matters pertaining to the Medical Corps Reserve and the American Medical Association.

(c) Corps area commanders will report, at times specified by the War Department, the number of Medical Corps Reserve officers under their assignment jurisdiction who are available for active duty.

(d) Vacancies in allotments made to any corps area by the War Department that cannot be filled by the detail of a qualified Reserve officer under the assignment jurisdiction of the corps area commander will be promptly reported to the War Department, which will cause them to be filled from Medical Corps Reserve officers in the Army and Service Assignment group, or by adding these vacancies to the allotment of other corps areas having a surplus.

(e) If no qualified Reserve officer can be found, the Surgeon General will notify his representative at Headquarters, Sixth Corps Area, as to the qualifications desired and the location and grade of the vacancy. The representative will then secure recommendations from the American Medical Association and forward all information to the appropriate corps area commander, notifying the War Department of the action taken. The corps area commander will immediately cause the candidate to be given a physical examination and, if found qualified, will secure from the applicant a properly completed application for commission (W. D., A. G. O. form 170). All papers will then be forwarded to the Adjutant General for final action by means of air mail and "Immediate Action" stationery when necessary.

(f) Corps area commanders are not authorized to grant waivers for physical defects in these instances but may reject a candidate when found physically disqualified, notifying the Adjutant General of the action taken.

(g) On receipt of a properly executed oath of office, the corps area commander will cause orders to be issued placing the appointee on immediate active duty.

(h) No appointments will be made under this authority of applicants over 55 years of age.

(i) The appearance of the candidate before an examining board as prescribed in AR 140-5 will be waived in these cases.

2. The Surgeon General and corps area and department commanders will complete all arrangements necessary to place the plan in operation without delay when directed by the War Department.

#### NUMBER OF PHYSICIANS AVAILABLE FOR MILITARY SERVICE AND FOR SERVICE TO CIVILIAN POPULATION

It was proposed in the plan outlined by Colonel Dunham at the New York session that an attempt be made to ascertain how many and what physicians in states and counties may be available for service with the military forces and for service at home. It is not believed that any but those who know conditions which actually exist in the individual states, counties and communities can properly undertake to perform such a task. The Committee on Medical Preparedness has, therefore, turned to the state chairmen and state and county committees for aid in this difficult and delicate matter.

In some instances, state and county committees have been disinclined to designate any physician as one who should serve in one capacity and another who should remain at home. The Committee on Medical Preparedness can fully appreciate this feeling and, where it is known to exist, has asked that an estimate be made of the number of physicians who may be now or who may later become available for military service and the number believed to be essential for service at home. It appears to be difficult to make such estimates pertaining to large cities.

Through the splendid aid of state chairmen and of state and county committees, good progress is being made in the undertaking referred to in this section of this report.

#### STATUS OF MEDICAL STUDENTS, INTERNS AND TEACHING PERSONNEL

It is essential for the public interest and for the purposes that may develop in any great national emergency that a constant supply of well qualified young physicians should be assured. It is necessary too that our hospitals shall be enabled to function in the most efficient manner possible. A period of intern training is required for graduation by a number of the recognized schools of medicine, and good intern service is essential to the successful operation of the modern hospital with any considerable bed capacity and occupancy. It is, of course, necessary that the teaching forces of medical institutions shall be maintained to the highest possible point of efficiency under any conditions that may obtain. In the Selective Service Act there is no provision for the deferment of medical students beyond the termination of the current college year. Interns may be deferred until the completion of their current term of training. No provision has been made for the deferment of residents in hospitals.

The Committee on Medical Preparedness has given careful and continued consideration to these matters. One of the Committee's first official acts was to adopt and to forward to various high officials of the federal government a resolution urging that arrangements be made under which our medical schools could continue to operate to the highest possible advantage; that medical students, interns and residents be permitted to complete their training in schools and hospitals, and that neither the student bodies nor essential teaching personnel be depleted to an extent that would interfere with the production of an adequate supply of well trained graduates each year. These recommendations of the Committee have been renewed from time to time and have received the support of the Council on Medical Education and Hospitals, of the Subcommittee on Medical Education of the Health and Medical Committee of the Federal Security Agency and of other important groups.

Suggestions have emanated from some sources to the effect that classes in medical schools should be enlarged. This Committee is not in accord with such suggestions for reasons that are, no doubt, perfectly obvious to the members of the House of Delegates.

#### SELECTIVE SERVICE SYSTEM ACTS TO DEFER MEDICAL STUDENTS AND INTERNS

As this report was being prepared, the following statement was released to the press by the Selective Service System:

To meet a "growing national shortage of physicians and surgeons," reported by the Office of Production Management, a policy of deferment from military training of individual medical students "who give reasonable promise of becoming acceptable medical doctors" was proclaimed, May 4, by Brig. Gen. Lewis B. Hershey, deputy director of Selective Service. These deferments should be continued in each case as long as the student is progressing satisfactorily, he said.

General Hershey's memorandum, which summarizes the report of the OPM, was sent to all state Selective Service directors for communication to their local boards. It stresses the OPM statement that the shortage of physicians and surgeons affects both the nation's armed forces and the civilian population and that the utmost care must be exercised to meet both needs.

Local boards are urged to see that, while no practicing physician whose services are necessary to his community is called for military service, the requirements of the armed forces for physicians and surgeons also are filled. It also is stressed that where physicians, including interns, are eligible for military service they should be encouraged to apply for Medical Reserve Corps commissions, but that they will be inducted if they are placed in class I-A and fail to take advantage of the opportunity to be commissioned. In the case of interns it was pointed out that, if commissioned, they will be deferred from active duty by the War Department to complete one year's internship.

Summarizing the OPM report on its study of the situation, General Hershey pointed out that it indicates a present need of around 9,000 medical officers for the Army, Navy, Public Health Service and Veterans Administration in addition to present staffs. This approximates a reduction of about 5 per cent in the number of physicians now available for service in

civilian life, and it is estimated that the further demand caused by health problems in communities expanded by new defense industries will increase this civilian need to about 10 per cent.

In addition to the 9,000 additional medical officers required by the Army, Navy and other defense agencies, General Hershey said the OPM report showed a probable annual turnover of around 3,500 because of retirement of regular medical officers and the expiration of tours of duty of reserve medical officers.

The OPM report estimates that there are 155,000 practicing physicians in the United States, of whom about 27,000 are 65 years of age or older, and the mortality is around 3,800 a year. Their places can be filled only by medical graduates who enter the profession each year and their number is estimated at approximately 5,000, of whom only 60 to 65 per cent probably would be qualified physically or otherwise for military service.

Commenting on this situation in announcing the Selective Service policy of deferring medical students who are making satisfactory progress in their professional training, General Hershey's memorandum to state directors stated:

There are no replacements for medical students who are withdrawn from school. Consequently if the supply of medical students who are to be graduated into the medical profession is reduced through their induction to serve in a nonprofessional capacity, an increasing reduction of physicians available for military service as well as an aggravation of the increasing overall national shortage will result.

As an outline of policy and procedure for the Selective Service System concerning medical students, General Hershey quoted the OPM report:

It is of paramount importance that the supply be not only maintained but encouraged to grow, and that no student or intern who gives reasonable promise of becoming an acceptable medical doctor be called to military service before attaining that status.

Local boards were cautioned, however, that deferment is not an exemption and that the obligation and liability for military service remain on its expiration.

General Hershey's memorandum also called attention to a previous one, issued on April 22, prescribing procedure for deferment of individual students in a number of specialized professional fields which were suggested by the Office of Production Management. This memorandum suggested procedure for presenting local boards with detailed facts concerning individual students, which was prepared by the American Council of Education and concurred in by National Headquarters of the Selective Service System. As set forth in a bulletin (number 10) issued by the council, this provides for getting into the hands of the local board of a "student statement of information" concerning his status and plans, and an affidavit by his college or university in which the college officials testify as to his standing, courses and occupational objectives, together with a general evaluation of the student as a "necessary man" for occupational deferment.

#### ESSENTIAL TEACHERS

At the request of the Committee on Medical Preparedness, the deans of medical schools have been asked, through the Council on Medical Education and Hospitals, to provide lists of personnel believed to be essential for teaching purposes.

#### MEDICAL EXAMINERS AND MEMBERS OF BOARDS

A large number of physicians are serving as examiners for draft boards and as members of advisory, induction and appeal boards and in other capacities under the Selective Service Act. Medical examiners and members of advisory and appeal boards serve without compensation. The exact number of those engaged in such service is not known to the Committee at this time.

There have been complaints that in some instances medical examiners have been required to devote an undue amount of time to their duties in such capacity. In many places alternate examiners have been appointed to share the work, and in some instances resident physicians have offered their services so that the work involved might be equably spread. In some areas alternates have been appointed to serve as members of induction boards so that no member would be required to give his entire

time during examination periods. In some cities all examinations of registrants are conducted in hospitals, and this arrangement seems to have been satisfactory to all concerned.

#### SOURCE OF SUPPLY OF MEDICAL OFFICERS

Physicians for service as medical officers can now be secured only from the Medical Reserve Corps. Students approaching graduation at recognized schools and interns who will complete their training within a specified time may apply for commissions and, if eligible, may receive commissions in the Medical Reserve Corps, and assignments to extended active duty may be deferred until courses of training are completed.

#### COMMITTEES CONCERNED WITH THE NATIONAL DEFENSE PROGRAM AND OTHER ACTIVITIES

The Health and Medical Committee of the Federal Security Agency is composed of Dr. Irvin Abell, Chairman; Major General James C. Magee, Surgeon General of the United States Army; Rear Admiral Ross T. McIntire, Surgeon General of the United States Navy; Dr. Thomas Parran, Surgeon General of the United States Public Health Service, and Dr. Lewis H. Weed, Chairman of the Division of Medical Sciences of the National Research Council. This Committee was originally appointed by Executive Order "To advise the Council of National Defense regarding the health and medical aspects of National Defense and to coordinate health and medical activities, affecting national defense." Other purposes to be served by the Health and Medical Committee were designated. At a later time the committee was transferred, by Executive Order, to the Federal Security Agency.

The National Research Council, cooperating with the federal government, has created a number of committees concerned most largely with various scientific aspects of the national defense program. Dr. Morris Fishbein, an ex officio member of the Committee on Medical Preparedness, is a member of the Executive Committee of the Division of Medical Sciences of the National Research Council and Chairman of the Committee on Information of that Division.

There seemed to be need for the publication of a special journal pertaining to military medicine, and the Board of Trustees authorized the publication of a periodical to be known as *WAR MEDICINE*. The active cooperation of the Division of Medical Sciences of the National Research Council has been generously extended in making possible the publication of this new periodical, which has been received with great interest in the United States and has attracted attention from official and unofficial sources in other countries.

The Chairman of the Council on Foods and Nutrition of the American Medical Association is serving as chairman of the Subcommittee on Nutrition of the Division of Medical Sciences of the National Research Council.

A National Conference on Nutrition is to be held in Washington, D. C. The Board of Trustees and the Council on Foods and Nutrition have assured the President of the United States and the Federal Security Administrator of active cooperation in this movement.

Dr. R. G. Leland, Director of the Bureau of Medical Economics, has served as a member of a committee of the Division of Vital Statistics of the Bureau of the Census and as a member of a committee of the Selective Service System and has cooperated with the Office of Procurement and Management. Conferences have been held with representatives of the National Resources Planning Board relative to the maintenance of lists of specialists in the basic medical sciences.

The Committee on Medical Preparedness of the American Medical Association has maintained the closest possible contact with the aforementioned committees, and most pleasant and cooperative relations have resulted.

#### PENDING FEDERAL LEGISLATION

A number of bills pertaining to one or another phase of the national defense program have been submitted to the Congress now in session. Senate Bill 783, introduced by Senator Murray of Montana, provides, among other things, that (1) students who are preparing for the degree of doctor of medicine or bachelor of medicine at medical schools, (2) students who are

preparing for the degree of doctor of dental surgery or doctor of dental medicine at dental schools, (3) hospital interns and resident physicians and surgeons who are graduates of medical schools and are eligible as such graduates for the examinations given by the National Board of Medical Examiners or who were so eligible at the time of their graduation at such medical schools, (4) hospital dental interns and resident dentists who are graduates of schools of dentistry or hold degrees of doctor of dental surgery or doctor of dental medicine, and (5) teachers at medical and dental schools shall be exempt from training and service but not from registration under the Selective Training and Service Act. This bill further provides that medical and dental students, hospital interns and resident physicians, surgeons and dentists and teachers in medical and dental schools who are members of a reserve component of the land and naval forces of the United States may not, if the bill should be enacted, be ordered or called to active duty or into active service in any of such forces, except in time of war, and that any such persons already called into active service who if the pending bill had been enacted would have been exempt from such service shall be discharged on their own request. A further discussion of S. 783 will be found in that part of the Report of the Board of Trustees pertaining to the work of the Bureau of Legal Medicine and Legislation. Hearings were held on this bill on March 18, 19 and 20, 1941, and some proposed amendments were offered. Statements have appeared in the public press indicating that this bill had been tabled indefinitely by the Committee on Military Affairs of the Senate, but information received as this report is in process of preparation is to the effect that an effort will be made to have the bill reported out by the Senate Committee.

H. R. 3571, introduced by Representative McCormack of Massachusetts, pending in the House Committee on Military Affairs, provides that no individual who is licensed to practice medicine under the laws of any state, territory or the District of Columbia shall be ineligible for appointment or for examination for appointment as a medical officer in the active or reserve components of the military or naval forces of the United States solely by reason of any rating or classification of the medical school at which such individual graduated.

H. R. 4184, introduced in the House of Representatives by Mr. Flannery of Pennsylvania, would specifically authorize the President to provide for the deferment from training and service, under such rules as the President may prescribe, of those men engaged in the study of medicine considered to be necessary to the maintenance of the national health in service or industry.

H. R. 4418, introduced by Mr. Faddis of Pennsylvania in the House of Representatives, is identical with a bill originally introduced in the Senate at the previous session of Congress by Senator Murray of Montana.

Various other bills have been submitted to Congress, all of which have some bearing on national defense. Among these is H. R. 3204 providing for an appropriation of \$525,000 for the fiscal year ending June 20, 1941 to enable the United States Public Health Service to assist state and local health authorities in health and sanitation activities in areas adjoining military and naval reservations or where there are concentrations of military and naval forces and in areas adjoining government and private industrial plants engaged in defense work. Another bill, H. R. 3570, proposes an appropriation of \$150,000,000 to provide additional community facilities made necessary by national defense activities. Under the provisions of this bill, \$25,000,000 would be used for the construction of hospitals and \$4,200,000 for the construction of clinics. In addition, annual grants of \$2,200,000 would be made for hospital care of transient indigents, \$2,800,000 for the ambulant care of transient indigents and \$1,000,000 for hospital operation.

A bill has been submitted to Congress contemplating the development of plans for school programs of physical education and "instruction and guidance in healthful living and wider recreational use of school facilities and plans for the establishment of school camps."

Various plans for the rehabilitation of the youth of the country and especially of Selective Service Registrants and others who will become eligible for registration have been proposed.

#### PHYSICIANS FOR SERVICE IN GREAT BRITAIN

Early in April 1941 a request came to the American Medical Association to cooperate with the American Red Cross in an effort to secure physicians up to the number of one thousand who would volunteer for service with the British army and the British emergency medical service. The American Red Cross is officially cooperating in this undertaking with the British Red Cross with the approval of the President of the United States and of official agencies of the federal government.

Through the use of the punch card system as it has so far been developed, the names of physicians who may be eligible for service abroad as indicated have been made available to the American Red Cross, which will communicate directly with these physicians. Information concerning this matter has appeared in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* and has been widely disseminated through radio broadcasting systems.

#### LIAISON OFFICER

Lieut. Col. Charles G. Hutter, M. C., U. S. Army, has served for several months as liaison officer of the Medical Corps of the Army with the Committee on Medical Preparedness. Colonel Hutter has been most helpful to the Committee and to those in the Association's offices who are concerned with the preparedness program and has won the respect and esteem of all who have been associated with him.

#### MEDICAL PREPAREDNESS SECTION OF THE JOURNAL

Through the establishment of the Medical Preparedness Section of *THE JOURNAL*, a mass of material pertaining to many phases of the national defense program has been made generally available. Abstracts of the minutes of meetings of this Committee and a large amount of information concerning official regulations, legislation, activities of state committees and of government services and many other matters have appeared in this section.

#### CORRESPONDENCE

The correspondence pertaining to the work of the Committee on Medical Preparedness and to the general preparedness program has been tremendous in amount. Effort has been made to reply as promptly as possible to every communication received, though there was a period of eight weeks during which the trial of the case of the United States versus the American Medical Association et al. was in progress when it became impossible to make prompt reply to all communications.

#### CONCLUSION

Many other matters than those referred to in this report have received official consideration by the Committee on Medical Preparedness. The Committee has earnestly attempted to discharge the duties imposed on it by the House of Delegates and in these efforts has received the most generous assistance from numerous sources, including scientific medical organizations and official committees of those organizations, government officials including the Surgeon Generals of the three major medical services of the government and members of their staffs, and Corps Area Commanders and Corps Area Surgeons.

The Committee desires especially to commend the state chairmen of the Committee on Medical Preparedness for their invaluable service in promoting the national survey of physicians and for the splendid work they have done in connection with other matters. State and county committees on medical preparedness have made fine contributions toward the accomplishment of the medical preparedness program of the American Medical Association. To all of these and to others not specifically mentioned in this report the Committee desires to acknowledge its deep sense of appreciation.

Respectfully submitted.

IRVIN ABELL, Chairman.  
STANLEY H. OSBORN.  
WALTER G. PHIPPEN.  
HARVEY B. STONE.  
JAMES E. PAULLIN.  
FRED W. RANKIN.  
ROY W. FOUTS.  
SAM E. THOMPSON.

CHARLES A. DUKES.  
JOHN H. O'SHEA.  
and ex officio  
NATHAN B. VAN ETTEN.  
ARTHUR W. BOOTH.  
MORRIS FISHBURN.  
OLIN WEST.

# ORGANIZATION SECTION

2783

## Resolution Requesting Establishment of Procurement and Assignment Agency

Dr. Irvin Abell, Chairman, Committee on Medical Preparedness, presented the following resolution, which was referred to the Reference Committee on Executive Session:

WHEREAS, The President of the United States has declared that we are in a state of unlimited national emergency, and the Surgeon General of the United States Army requested the American Medical Association in June 1940 at the annual session to aid in the procurement of approximately 150,000 physicians as well as a statement as to their training, experience and specialization; and

WHEREAS, The American Medical Association established a Committee on Medical Preparedness which has now on hand the records of approximately 150,000 physicians as well as a statement as to their training, experience and specialization; and

WHEREAS, The sudden entrance of the United States into a war might immediately require the services not only of the physicians already called to duty but of a very considerable additional number; and

WHEREAS, Neither the American Medical Association nor any other civilian agency has the responsibility or the authority for the selection of those physicians who would be necessary for immediate duty and who would be called from civilian practice into service with the military agencies; therefore be it

Resolved, That the United States government be urged to plan and arrange immediately for the establishment of a central authority with representatives of the civilian medical profession to be known as the Procurement and Assignment agency for physicians for the Army, Navy, and Public Health Service and for the Civilian and Industrial needs of the nation.

This recommendation is made to avoid or minimize confusion and the inevitable delay which would result from the lack of such an arrangement. It is further recommended by the Committee on Medical Preparedness that, if this resolution is approved by the House of Delegates, a copy of it be sent to the President of the United States, the Secretary of War, the Secretary of the Navy, the Chairman of the Senate and House Committee on Military Affairs, the Administrator of the Federal Security Agency, the Surgeon General of the United States Army, the Surgeon General of the United States Navy, the Surgeon General of the United States Public Health Service, the Adjutant General of the Army and the Health and Medical Committee.

## The Training of Physicians Must Be Continued Without Interruption

Dr. Irvin Abell, Chairman, Committee on Medical Preparedness, presented the following statement, which was referred to the Reference Committee on Executive Session:

A Joint Conference of the Committee on Medical Preparedness of the American Medical Association and the Council on Medical Education and Hospitals, held at the Statler Hotel in Cleveland on Monday, June 2, prepared the following statement for transmission to the Secretary of War and to the Surgeon General of the Army:

1. Since the five year preparedness program of the government may require all graduates of approved medical schools annually, in addition to those who may be available from other sources, to enter the service of the Army, Navy and Public Health Service for a year's training, the education of physicians must be continued at the present level and without interruption.

2. The education of physicians is so vital that we urge the War Department to provide for all medical students in approved medical schools and for premedical students accepted for enrollment in approved medical schools some form of military status which will make clear the fact that, in preparing themselves to become physicians for the services of the country, these students are already actually giving an essential service under the preparedness program and are not seeking to evade, escape or defer their responsibilities.

## Report of Council on Scientific Assembly

Dr. James E. Paullin, Chairman, presented the following report, which was referred to the Reference Committee on Sections and Section Work:

The Council on Scientific Assembly recommends to the House of Delegates of the American Medical Association that the annual session to be held at Atlantic City in 1942 be made a Pan American meeting and that representatives from all South and Central American countries, Mexico, Cuba, Puerto Rico and Canada be invited to attend and participate in the scientific session program.

## Report of Council on Foods and Nutrition Dealing with the National Nutrition Conference for Defense

Dr. James E. Paullin, Section on Practice of Medicine, on behalf of Dr. James S. McLester, Chairman of the Council on Foods and Nutrition, who was not in attendance because of the illness of his mother, presented the following report, which was referred to the Reference Committee on Executive Session: The National Nutrition Conference for Defense, on the call of the President, was held in Washington during the week of May 26.

Approximately nine hundred persons were in attendance, and of the entire personnel of the conference about 15 per cent were physicians. Nutritionists, social workers, labor representatives, economists, manufacturers of food and others made up the bulk of the membership. In a movement of this kind, leadership should remain in the hands of the medical profession. The work of the conference was conducted in nine previously selected sections, each of which dealt with a different phase of nutrition. The objectives of the conference as a whole and the general trend of the recommendations merit your entire approval.

The following resolution is submitted for your approval:

Resolved, That the House of Delegates of the American Medical Association expresses its approval of the general objectives of the National Nutrition Conference for Defense called by the President of the United States and specifically endorses the following recommendations:

1. That research in nutrition be encouraged, with an aim primarily toward (a) Improvement of presently known chemical and biological procedures for estimating the amounts of the essential nutrients in foods and their physiologic availability; (b) more refined technique for the detection of nutritional deficiency states, especially in the subclinical degrees of intensity; and (c) more precise determination, for each of the nutrients, of the optimum and minimum requirements of human subjects under varying conditions;
2. That special attention be paid to the diets and nutritional status of all workers in industry and particularly of those most directly concerned with the national defense effort;
3. That, in providing an adequate diet for pregnant and lactating women and for children, the necessity be appreciated for taking into consideration the whole family situation and the limitations of the budget;
4. That closer cooperation between medical and public health groups and other agencies interested in nutrition be established in order that effective local action may be taken;
5. That medical societies, dental societies and health authorities be represented on all state and community nutrition committees and that medical groups take an increasingly active part in organizing, sponsoring and cooperating in nutrition programs;
6. That efforts be made to stimulate greater interest in nutritional problems among general practitioners and, with this in view, that opportunity for postgraduate training in nutrition be made more widely available, and finally, but vastly more important,
7. That schools of medicine give greater thought to the teaching of nutrition.

Respectfully submitted.

JAMES S. McLESTER, Chairman.

## Report of Committee on Legislative Activities

Dr. E. H. Cary, Chairman, presented the following report, which was referred to the Reference Committee on Legislation and Public Relations, with the exception of that portion which relates to the construction of community facilities, which was referred to the Reference Committee on Executive Session:

As the Congress for the last year has given primary consideration to measures dealing with defense problems, it has not been found necessary for the Committee on Legislative Activities to function actively in connection with any particular federal legislation.

The report of the Bureau of Legal Medicine and Legislation brought to your attention a survey of all the bills which have been introduced that are of sufficient importance for any consideration.

Hospital Construction Bill S. 1230 was reintroduced by Senator Brown, for himself and Senators Wagner and George, embodying all the objectionable features commented on by the House of Delegates at the New York session. It may be worth while to call your attention to the fact that, when the bill was before the Senate in the 76th Congress, it was amended on the floor with the words "The eight appointed members shall be selected from leading medical, osteopathic or scientific



Hospital Association and the Protestant and Catholic hospital associations of the United States, the conjoint committees to study and submit reports to their respective national bodies, in which would be outlined platforms or principles designed to clarify the relation of medical services that may be offered in prepayment hospitalization and similar plans, the same to be in line with the basic principles laid down in the past by the House of Delegates and other authorities of the American Medical Association, was approved by your reference committee, which recommends its adoption.

(b) The second portion of these resolutions, requesting the Board of Trustees to proceed to these matters as expeditiously as may be possible, and to submit the committee's report, with such suggestions and/or recommendation that the Board of Trustees may wish to attach thereto, at the next annual session of the American Medical Association, the Board of Trustees to be authorized in the interim to advise the constituent state associations of the American Medical Association concerning tentative or other agreements that may have been reached, is emphatically approved by your reference committee at this time because the subject matter of this resolution was presented both at the St. Louis and at the New York session but finds that the extra work thrown on the administrative offices of our organization by court procedures and by the medical preparedness program has made it well nigh impossible to make a careful study and report covering the subject matter involved in this resolution.

2. Medical Service Plans: Your reference committee further recommends that the specialty societies, such as radiologists, pathologists and anesthesiologists, recommend to their members that they defer entering into contractual relationships with hospitals involved in medical service plans until the relationship has been thoroughly clarified as requested in the resolutions from the California Medical Association.

Respectfully submitted.

HENRY A. LUCE, Chairman.  
F. J. PINKERTON.  
JOHN H. FITZGIBBON.  
TERRY M. TOWNSEND.  
F. S. CROCKETT.

#### Report of Reference Committee on Amendments to the Constitution and By-Laws

Dr. William Weston, Chairman, presented the following report, which was adopted on motion of Dr. Weston, seconded by Dr. Arthur T. McCormack, Kentucky, and carried:

Your reference committee approves of the amendment to the By-Laws, chapter XV, section 1, item 7, to change the name of the Section on Pharmacology and Therapeutics to the Section on Experimental Medicine and Therapeutics.

Respectfully submitted.

WILLIAM WESTON, Chairman.  
EDMUND R. BRUSH.  
EDWARD M. PALLETTE.  
J. N. BAKER.  
WALTER W. KING.

On motion of Dr. Arthur T. McCormack, Kentucky, seconded by Dr. George W. Kosmak, New York, and carried, chapter XV, section 1, item 7 was amended to read "7. Experimental Medicine and Therapeutics."

#### Report of the Reference Committee on Reports of Board of Trustees and Secretary

Dr. Francis F. Borzell, Chairman, presented the following report, which on motions duly seconded and carried was adopted section by section and as a whole:

##### REPORT OF THE SECRETARY

Your reference committee has reviewed the report of the Secretary. It is pleased to emphasize the report of continued growth in our membership. Gratifying as this progress is, examination, however, of the tabulation made by states indicates fertile fields for cultivation that should be filled.

The report of the Secretary on Fellowship enrolments shows also a wholesome increase in the number of Fellows, but here too we would wish to see an accelerated growth.

Your reference committee notes with appreciation the greatly augmented field work carried on by the officers, both elective and administrative, over the past year.

Your reference committee feels that the Secretary's modest report presents but inadequately the true story of the faithful stewardship of Dr. West. With the ever increasing demands on the Secretary in time and energy, the committee expresses the wish that all consideration be given to the possible necessity for providing him with added assistance.

Your reference committee urges the House of Delegates to take heed to its own prior action that memoirs and resolutions be forwarded to the Secretary, wherever possible, thirty or sixty days before the annual session.

##### REPORT OF THE BOARD OF TRUSTEES

1. Your reference committee concurs with the Board of Trustees in the expression of grief at the loss by death of one of their faithful members, Dr. Austin A. Hayden, and of Dr. Paul Nicholas Leech, the Director of the Division of Drugs, Foods and Physical Therapy, Secretary of the Council on Pharmacy and Chemistry and Director of the Chemical Laboratory.

Income and Expenditures: Your reference committee notes with satisfaction the healthy state of the finances of our Association. The details are published and need no elucidation. They indicate most efficient and judicious administration by the Board of Trustees.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION: Your reference committee is pleased to note the continued success of THE JOURNAL both as the universally recognized leader in its field and as to the increase in circulation. Here also our editorial and business personnel are to be commended for their efficiency. Your committee would emphasize the added significance of this growth in the light of experiences in war-torn foreign countries.

Press Relations: Your reference committee respectfully recommends careful reading of this section of the Report of the Board of Trustees. Because of the far reaching influence of friendly press relations and because of occasional unwarranted criticisms by the uninformed, your reference committee recommends the widespread publication of this part of the report in county and state society journals. Your reference committee recognizes the invaluable services of the Editor in establishing these favorable press relations. One striking example is the prompt radio and press publicity in reference to contaminated sulfathiazole.

2. Special Journals: Your reference committee is pleased to note the growth in circulation of the special journals. It also commends the valuable addition of the new publication WAR MEDICINE.

Library: While the activities of the package library service show some increase, your reference committee would recommend more widespread use of these reference facilities than at present.

HYGEIA: Your reference committee notes with satisfaction the increasing popularity of HYGEIA, particularly as a reference publication for health and education. It urges increased local activities looking toward wider distribution of this publication.

Council on Pharmacy and Chemistry: The report of the activities of the Council on Pharmacy and Chemistry emphasizes anew the importance of this department. Investigation by the Council of the newer chemotherapeutic agents, vitamins and hormones are proving invaluable to the profession and to the United States Food and Drug Administration. Your reference committee commends the Council for its continued successful functioning.

Council on Foods and Nutrition: The report of the Council on Foods and Nutrition indicates timely attention to the problems of nutrition, emphasized by the needs of national defense. Your reference committee respectfully recommends that this council be urged to keep in closest touch with federal movements in the field of nutrition to insure intelligent medical direction of public programs.

3. Council on Physical Therapy: Your reference committee, while commending the Council for its continued valuable ser-

vices, calls especial attention to the importance of the studies on roentgen ray problems and urges widespread publicity of the article on "X-Ray Protection" published in *THE JOURNAL*. Reprints should be widely distributed to hospitals and roentgenologists.

**Council on Industrial Health:** The report of this council is recommended by your reference committee for full approval. Your reference committee considered carefully the importance of the relations of this council to national defense as indicated in its report. It urges careful study of the report by the members of this House that they in turn may institute the necessary cooperative activities in their respective state organizations. Your reference committee commends the Council for its forehanded liaison with federal agencies and recognizes the importance of joint functioning of committees on industrial health in state medical associations with bureaus of industrial hygiene and workmen's compensation commissions in the state governments.

**Committee on Scientific Research:** The report of the Committee on Scientific Research calls for no special comment from your reference committee. It did note, however, a rather large number of completed grants the results of which are still "to be published." Doubtless more detailed explanation might elucidate.

**4. Bureau of Medical Economics:** The report of the Bureau of Medical Economics is divided into four headings, the first three of which deal strictly with medical economics while the fourth is a report of its activities for the Committee on Medical Preparedness. Each division is of sufficient importance to call for separate attention by this reference committee.

(a) **Prepayment Plans for Medical Care:** This is a report of trends and tendencies to date in this field. The bureau has made certain deductions which call for serious consideration by the members of this House. It emphasizes the trends toward increasing utilization of tax funds in the provision of medical care. Certain observations are then made which, in the opinion of your reference committee, are of sufficient importance to warrant their emphasis by way of specific approval.

Your committee seriously considered the added tasks incident to the work assigned to the bureau by the medical preparedness census, particularly in the light of possible curtailment or arrest of further necessary study of the ever increasing numbers of prepayment medical service plans. It is recommended that the Board of Trustees take whatever steps are necessary to insure the continuity of this important phase of the work of this bureau to the end that there may be established some method of coordination and interchange of material pertinent to the administration of such plans in order that all state and county medical societies may profit thereby.

Your reference committee further recommends that the House of Delegates reaffirm its belief that the principle of prepaid medical care justifies an experimental period during which time advice and assistance be given to medical societies that elect to conduct such experiments under medical sponsorship. It therefore recommends special consideration and approval by the House of this portion of the report.

(b) **Survey of Medical Services:** Under the heading of Survey of Medical Services and Facilities for the Care of Crippled Children is a report of certain activities of the bureau which apparently resulted in information of value to many. Your reference committee notes the absence of any reference to proposed publication of the conclusions of this survey.

(c) **Group Medical Practice:** Group Medical Practice is considered under another heading. The conclusions in the report deserve detailed consideration by the members of this House. Your reference committee recommends that studies of group medical practice be continued with a view toward further clarification.

Another division of the report of the bureau deals with a report on a survey of physicians for the Committee on Medical Preparedness as a part of our efforts to assist the Surgeon Generals of the Army, Navy and Public Health Service. Your reference committee is impressed with the size of this task undertaken by the bureau and gratified with the efficiency of its accomplishment.

**5. Bureau of Health Education:** Your reference committee recommends approval of the report of the Bureau of Health Education. This report epitomizes a year of intense activity of the kind to bring credit on the American Medical Association and the American physician.

The public relations value of this bureau is second only to its value as an authoritative health educational agency. Its policy of cooperative assistance and advisory guidance of governmental and lay organizations interested in health education calls for wholehearted approval by this House and your reference committee so recommends.

**6. Bureau of Legal Medicine and Legislation:** Without attempting a detailed consideration your reference committee notes with approval the evidence of vigilant scrutiny of proposed legislation affecting medicine and health obvious in the report of this bureau, which deserves detailed consideration by the members of this House.

It is noted that twenty-five states have now adopted legal measures to control the dispensing of barbiturates only in medical prescriptions. Your reference committee recommends to the House of Delegates that efforts be put forth to stimulate the remaining states to adopt similar legislation.

**7. Supplementary Report of the Board of Trustees:** Your reference committee recommends that the Board of Trustees be asked to establish a Commission on Pan American Relations to advise on the various problems of Pan American import.

Your reference committee is impressed with the multifarious responsibilities of the Board of Trustees and the bureaus functioning under its direction. Especial commendation is extended to the executive directors of these bureaus. To them belongs the credit for their efficient operation.

Respectfully submitted.

FRANCIS F. BORZELL, Chairman.  
F. J. SAVAGE.  
ROBERT A. PEERS.  
MEREDITH MALLORY.  
WILLIAM R. BROOKSHER.

#### Report of Reference Committee on Miscellaneous Business

Dr. Charles G. Strickland, Chairman, presented a report which as amended reads as follows:

**1. Resolution Requesting Appointment of a Committee to Survey the Relationship of Medicine and Law:** There appeared before your reference committee as proponents of this resolution Professor Moritz, newly appointed professor of legal medicine at Harvard, and Drs. Dwight O'Hara and Charles E. Mongan, Massachusetts. These gentlemen stated that as early as 1931 a committee had been appointed by the House of Delegates of the American Medical Association to work with the Bureau of Legal Medicine and Legislation to formulate a solution of the problem with which this resolution deals and that this committee apparently fell by the wayside.

Your reference committee recognizes the merit of the position taken by the resolution and strongly sympathizes with its intent. However, owing to widely differing conditions, both geographic and political, existing in the forty-eight states, the length of time necessarily required and the possible expense involved to accomplish its purpose, your reference committee recommends that, instead of passing this resolution as introduced, the House of Delegates refer it to the Board of Trustees and request sympathetic study of the problem involved.

**2. Resolution Requesting Appointment of a Committee to Study the Question of Determination of Serum Sensitivity:** The possibilities opened up by this resolution were discussed by your reference committee at length. The plan suggested has merit and deserves further study. Other conditions than serum sensitivity, as, for instance, diabetes and epilepsy occurring in persons admitted to hospitals in coma and without history, would be similarly helped and the patient protected if a standard tattoo code covering all these ailments could be devised. It would be, however, a long time before such a tattoo code could come into general use because of reasons which will readily occur to you. Your reference committee therefore recommends that, instead of accepting or rejecting this resolution, the House of Delegates

refer it to the Council on Scientific Assembly for study and such action as your Board of Trustees may order.

3. Resolution Requesting Appointment of a Committee to Confer with Specialty Boards: Your reference committee feels it inadvisable to set up a special committee for the purpose designated. Some inequalities on distribution of medical care undoubtedly exist. It recommends that the Michigan State Medical Society's resolution be referred to the Board of Trustees for its information and such action as it may care to take.

Respectfully submitted.

CHARLES G. STRICKLAND, Chairman.  
FREDERIC E. SONDERN.  
HOLMAN TAYLOR.  
CHARLES E. KIELY.  
ANDREW F. MCBRIDE.

It was moved by Dr. Strickland, seconded by Dr. Frederic E. Sondern, New York, and carried after discussion by the Secretary, that the first section of the report of the reference committee, referring to the Board of Trustees the resolution regarding a survey of the relationship of medicine and law, be adopted.

It was moved by Dr. Strickland that the second section of the report of the reference committee, referring to the Bureau of Health Education the resolution dealing with the determination of serum sensitivity, be adopted, and the motion was seconded by Dr. Arthur T. McCormack, Kentucky. The suggestion was offered that the matter be referred to the Council on Scientific Assembly and Dr. Strickland accepted this suggestion, following which this section of the report of the reference committee was adopted, as amended, after discussion.

Dr. Strickland moved that the third section of the report of the reference committee, referring to the subject of specialty boards, be adopted, and the motion was seconded by Dr. J. Newton Hunsberger, Pennsylvania, and adopted after discussion by a number of delegates.

On motion of Dr. Henry A. Luce, Michigan, seconded by several, and carried, a resolution dealing with hospital privileges for general practitioners, which had been before the House, was rereferred to the reference committee.

On motion of Dr. Strickland, seconded by Dr. John Z. Brown, Utah, and carried, the report of the reference committee as amended was adopted as a whole.

#### Report of Reference Committee on Sections and Section Work

Dr. George W. Kosmak, Chairman, presented the following report, which was adopted section by section and as a whole on motions of Dr. Kosmak, duly seconded and carried:

Your Reference Committee on Sections and Section Work has given careful consideration to the Report of the Council on Scientific Assembly as well as to the resolution introduced by Dr. Henry A. Luce, Michigan.

1. Report of Council on Scientific Assembly: The recommendation dealing with the change of name of the Section on Pharmacology and Therapeutics to "Section on Experimental Medicine and Therapeutics" is approved by your reference committee and submitted for action by the House.

Commendation and approval of the scientific program developed for this session by the Council is hereby extended.

2. Resolution Requesting the Creation of a Section on General Practice: Careful consideration was given to the question of establishing a new "section for the general practitioner." This was felt by the Council on Scientific Assembly to be undesirable. Your reference committee discussed the matter in connection with the resolution presented by Dr. Luce and submits to this House its belief that an experimental "session" in the Section on Miscellaneous Topics be established for the purpose of testing out the plan at the next session of the Association. If successful in point of attendance and interest, the question of establishing a permanent section can then be given further consideration.

Your reference committee feels that the general practitioner constitutes such an important and numerous factor in the membership of this Association that his requests should be given due consideration.

If the House reacts favorably to our suggestion, the officers appointed to conduct the "session" must be selected with a view to presenting a program that will meet the requirements of the situation.

3. Request of Council on Scientific Assembly that Atlantic City Session in 1942 Be Made a Pan American Session: Your reference committee desires to commend the proposition in the supplementary report of the Council on Scientific Assembly and fully approves of the recommendation contained therein that the annual session to be held in Atlantic City in 1942 be developed as a Pan American gathering and that representatives from all South and Central American countries, Mexico, Cuba, Puerto Rico and Canada be invited to attend and participate in the program of the Scientific Assembly.

Respectfully submitted.

GEORGE W. KOSMAK, Chairman.  
HILTON S. READ.  
ROLLO K. PACKARD.  
DAVID D. SCANNELL.

#### Report of Reference Committee on Rules and Order of Business

Dr. Thomas F. Thornton, Chairman, presented the following report and moved its adoption:

Your reference committee recommends that at the close of this meeting the House recess to convene in regular executive session at 2 o'clock this afternoon.

Respectfully submitted.

T. F. THORNTON, Chairman.  
FLOYD S. WINSLOW.  
JAMES Q. GRAVES.  
JOSEPH F. SMITH.  
E. N. ROBERTS.

Dr. R. W. Fouts, Nebraska, moved as a substitute that the House convene in regular session at 2 p. m. and meet in executive session at any time it desires after that, and the motion was seconded by Dr. Thomas A. McGoldrick, New York, and carried.

The report of the reference committee was then adopted as amended.

#### Report of Reference Committee on Reports of Officers

Dr. C. W. Roberts, Chairman, presented the following report, which was adopted section by section and as a whole on motions of Dr. Roberts duly seconded and carried:

1. Address of Speaker: Your reference committee desires to commend the Speaker for his zeal, both in spirit and in the performance, which has made possible the accomplishment of his hope that the actions of this House would reflect an atmosphere in which deliberate judgment and unregimented conclusions regarding the various matters brought before it would prevail. It knows that the past pronouncements of the House have issued from strict parliamentary procedure notwithstanding allegations in certain quarters to the contrary. Your reference committee joins the Speaker in support of his purpose to preserve a practice which has made of this House a model for deliberative bodies seeking to exemplify democratic processes in government.

The Speaker posed a question to the House. "Whom do you represent? What interest or interests do you espouse?" Gallantly the answer was frankly forthcoming in his own words, which your reference committee paraphrases. It is a profession based on ideals which you truly represent. In a world where so-called realism is offered as a panacea for all our ills and expediency adjudged decent as a camouflage for questionable political manipulations, it has become a little old fashioned to confess in intellectual circles to a reverence for idealism. Notwithstanding, your reference committee desires to commend the Speaker for his emphasis of the fact that medicine rests today as it has in the past on the cornerstone announced in the opening sentences of the Principles of Medical Ethics. A profession has for its primary object the service it can render to humanity; reward or financial gain should be a subordinate consideration. This has been a basic principle of medical ethics since the time of Hippocrates. If more than lip service to this

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principle is to be given, the Speaker catalogues a few familiar qualities which must continue to characterize our membership: integrity, courage, wisdom, tolerance, ability, vision. He intimates that if medicine falls from its high estate as a profession to that of a trade it will not be by judicial decree but through a neglect of the eternal values that have made our profession one for which we are proud to live and in which we are content to die. Together with its thanks to the Speaker, your reference committee asks for a rededication of our profession to these moving sentiments in the sure knowledge that we may thus justify the confidence which a grateful public has lavished on us.

2. Address of the President: Dr. Van Etten touched pointedly on a number of matters of great interest to our entire profession. Your reference committee would emphasize his insistence on the value of postgraduate education and the necessity of the physician of today relating his thinking to our changing social picture. Your reference committee wishes here to express its appreciation for his many contributions to the study of the complex problems that have faced the medical profession during the past decade. When the final story is written, his name will stand high among those wise councilors who have guided us during this troubled time. Your reference committee joins him in reaffirming the recommendation of this Association that a national department of health be created under a director of cabinet rank to coordinate and direct all the various health activities of the government not concerned with the care of the armed forces.

He has drawn a clear distinction between the functions of a public health service concerned with the prevention of disease and that of the practitioner of medicine who is skilled in the treatment of disease in the individual. Your reference committee commends for your consideration his cogent and forceful defense of organized medicine and especially his evaluation of the services rendered by our Board of Trustees and our executive officers. With him your reference committee feels a justifiable pride in the response made by the members of our Association to the call of our government and it affirms its willingness and purpose to devote to the service of our country every resource of our organization.

It has been said that, when the nightingale sings, all the other birds of the forest withhold their notes lest they distort the harmony of the nightingale's song. No words in eulogy of the President's address are needed. The message speaks eloquently for itself. Neither by mere words can your reference committee add any whit to his stature or by neglect detract from your recollection of his outstanding contribution to medicine during his period of office. He is superb in leadership, persuasive in voice, sincere without affectation, tolerant of those who hold honest differences, constructive, advocate and author of safe principles for the guidance of the profession and the establishment of equitable procedures for the distribution of medical care to the underprivileged and unflinching proponent of the best in medicine for a profession which he regards as the best on earth. These qualities, to recite only a few, have endeared him to our membership. While words are inadequate to express its thanks, your reference committee desires to record here in your name an expression of highest appreciation for a service superbly performed. The passing year will reveal an ever increasing fold of benefits flowing from his sacrificial services in behalf of American medicine. As he returns to the stethoscope our love goes with him.

3. Address of the President-Elect: Your reference committee is in ready agreement with the President-Elect's commendation of the officers of the American Medical Association for the efficiency exhibited in the management of an institution whose interests are of necessity so broad and so variable. It is recognized that it is through the devoted activities of the full time employees of the Association but no less through the sacrificial services of the officers, councils and committees of the Association working with no thought of monetary reward that the President-Elect is able to voice this just appraisal of the Association's business and scientific management. Your reference committee notes the concern of the President-Elect for the physical welfare of the Association's officers, espe-

cially that of the occupant of the Presidency. It is in sympathy with the humane motive that prompted this observation. All agree that the duties imposed on the President-Elect and the headquarters' officers, but particularly the President, are arduous, exacting and calculated to make serious demands on health and reserve. It is undoubtedly true that, through a recognition of these dangers and the exercise of a more discriminating judgment, calls on the President for official visits to constituent societies could be lessened. Your reference committee is convinced, however, that the spoken word has come to occupy a position of increasing importance in the promulgation of the Association's policies among the members and in the discharge of its civic obligation to the public. The very fact that there is increasing demand by constituent associations for personal visits from the Association's officers is of itself proof of the indispensable nature of the activity. Recognizing that the President-Elect had no thought of suggesting any crippling curtailment of this activity but simply felt impelled, as he says, from observation of the effect of these duties on the health welfare of the occupants of the Presidency to draw attention to its gravity in the hope that wider efforts would be made to minimize the calls made on him, your reference committee draws your attention to this observation confident that it meets your approbation and will have your support. Your reference committee would reemphasize, however, its conviction that judicious use of the headquarters officers and of the President and President-Elect is essential to continued growth of the influence of the Association in professional and public relationships. It believes that the Board of Trustees and the General Manager of the Association can be relied on to weigh this matter and set it in its proper relation, giving due consideration to the interests of both the Association and its officers. Your reference committee therefore suggests that the matter be left in the capable hands of the Board of Trustees for wise consideration.

The President-Elect suggests the advisability of keeping young men coming into the House of Delegates and their placement on important committees in order that through experience they may be prepared to fill vacancies as the older men become inactive. This idea is worthy of support, and your reference committee commends it to your serious consideration. Perhaps it would be wise if constituent associations in the election of alternate delegates would select them from the younger members of their organizations and consider sending them to the annual session of the House of Delegates as observers. Surely they would profit from such nonofficial contacts with the activities of the annual sessions.

Your reference committee desires particularly to record its agreement with the President-Elect's reference to the necessity of subordinating all trivialities and conflicts of opinion to the pressing need of national unity and national preparedness. As the President-Elect has stated, suits, privileges, personalities, personal opinions in the light of the world conflict would best be relegated to a secondary position. In this sentiment your reference committee is in ready agreement and commends it to your thoughtful consideration. The medical profession yielding none of its prerogatives will nevertheless continue to give in this emergency, as it has in past similar crises in our country, its unswerving loyalty to the nation's welfare.

4. Report of Judicial Council: (a) In the report of the Judicial Council attention is called to the lack of uniformity among the several states as to the requirements for membership. While there is no disposition on the part of your reference committee to lay down any rigid requirements as to membership in the various state associations, it is felt that in the interest of families a certain uniformity should be observed since representation in this body is based on the number of physicians recorded as members of the state associations. Your reference committee therefore recommends that the Judicial Council, as a guide to the state associations, draw up recommendations as to the proper basis of membership and define the status of the various classes of members in such associations, and it further recommends that representation in this body be based on the number of active members in each society.

(b) Your reference committee concurs in the opinion of the Judicial Council that controversial matters that may arise in any local society should be reviewed by the grievance committee

of the local society concerned and then by the properly constituted state agency before being referred to the Judicial Council.

(c) Your reference committee concurs in the opinion of the Judicial Council that it would be unwise to grant to any of the specialist groups the right to display special insignia in any form.

(d) Careful consideration has been given by the Judicial Council to the question of representation in this body. At present the total membership of the House is limited to one hundred and seventy-five, divided as follows: one member from each state and territory for each nine hundred and thirty members or fraction thereof, one representative from each of the several sections of the Scientific Assembly, and one representative each from the medical department of the Army, from the medical department of the Navy and from the Public Health Service. With the gradual increase in the number of sections, there has been a corresponding decrease in the proportionate representation of the several states. Furthermore, since the members of the sections are members of their respective constituent state associations, they now have double representation. Your reference committee suggests that the interests of the sections might still be well conserved if they were given a nonvoting status and that a more equitable representation would be effected if state representation was based on a certain fixed number of members or major fraction thereof. At present the proportionate representation of certain of the sections based on their registered attendance is several times as great as that allowed the state societies. Your reference committee feels that all the branches of the government services should be continued on their present basis since their delegates speak in behalf of physicians not otherwise represented. An alternative to this suggested change in the constitution of the House would be through revision of the By-Law which at present limits voting membership to one hundred and seventy-five.

Your reference committee therefore recommends that the Judicial Council consider carefully this whole matter of representation in the House of Delegates with the purpose of devising a fair and equitable basis of representation.

Respectfully submitted.

C. W. ROBERTS, Chairman.  
H. G. HAMER.  
L. G. CHRISTIAN.  
A. R. McCOMAS.  
WALTER B. MARTIN.

## NEW BUSINESS

### Resolution on Serologic Tests for Syphilis

Dr. Walter B. Martin, Virginia, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, A number of state laws have been enacted which, under certain conditions, make serologic tests for syphilis compulsory; and

WHEREAS, Standardization of laboratories performing serologic tests under the terms of these laws has become necessary and is being carried out; and

WHEREAS, For biologic and technical reasons there are a considerable number of false positives reported from standardized laboratories; and

WHEREAS, The reporting of false positives may work a grave injustice to certain individuals and result in great suffering; therefore be it

*Resolved*, That the Board of Trustees of the American Medical Association through an appropriate bureau or committee investigate the problem with special reference to (1) the advisability of such laws, (2) safeguarding the public as far as possible against such false positives and (3) the relative emphasis to be laid on the specificity and sensitivity in establishing criteria for standardization of laboratories under these laws.

### Resolution on Establishment of Central Institute for Research in Nervous and Mental Diseases in the United States Public Health Service

Dr. H. A. Luce, Michigan, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, Mental and nervous diseases, including epilepsy, constitute one of the largest, if not the largest, unsolved problems in medicine; and

WHEREAS, There are now on the books of institutions caring for mental diseases and deficiency more than six hundred thousand patients and the states and the federal government spend upward of \$200,000,000 a year for the care and treatment of these patients; and

WHEREAS, Less than 0.5 per cent of this amount is spent for research in these diseases by the states and the federal government; and

WHEREAS, Research into mental and nervous diseases and epilepsy offers possibilities, for decreasing the suffering and expense due to these diseases; and

WHEREAS, Research into nervous and mental diseases and epilepsy has been relatively neglected owing to lack of financial support; therefore be it

*Resolved*, That the House of Delegates of the American Medical Association approves the principles of the plan that has been advanced to establish in the Public Health Service a central institute to carry on clinical and laboratory research in nervous and mental diseases, and to extend financial aid to outside institutions and agencies to carry on research projects approved by a national council set up to act in an advisory capacity to the institute.

### Resolution on Certification in Recognition of Special Qualifications for General Practice

Dr. George R. Dillinger, Indiana, presented the following resolution, which was referred to the Reference Committee on Miscellaneous Business:

WHEREAS, There are in existence qualifying boards for the certification of physicians practicing the various specialties; and

WHEREAS, There is no present available method for the qualification and certification of physicians in general practice; therefore be it

*Resolved*, That the House of Delegates of the American Medical Association authorize the Board of Trustees through its councils or any other agency to give study to the matter of developing standards and means by which certification may be given in recognition of special training, experience and fitness, and special qualifications for general practice.

### Resolution on Appeal of British Red Cross for American Physicians

Dr. Thomas A. McGoldrick, New York, presented the following resolution, which was referred to the Reference Committee on Military Preparedness:

WHEREAS, The President of the United States on April 17, 1941 has, as president of the American Red Cross, endorsed the appeal of the British Red Cross for one thousand young American physicians; and

WHEREAS, The American Medical Association, in an editorial in THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, has assured Britain of every possible assistance and has supplied the Red Cross with lists of eligible young doctors, thereby endorsing the principle that American physicians be encouraged to volunteer for foreign service; and

WHEREAS, Of the five thousand annual graduates of American medical schools only three thousand, or 60 per cent, are physically acceptable for military service and available to meet the demands of an expanding military establishment, thereby necessitating substantial requisitions from the ranks of those now in private practice in addition to depriving the civil population of 60 per cent of the new graduates; and

WHEREAS, The maintenance of those standards of military and civil health made possible by the thorough education and training of the American physician and now demanded by the people of the United States is vital to the defense of the nation and the welfare of its population; and

WHEREAS, The Medical Society of the State of New York, with these facts in mind, has instructed its delegates to propose that the American Medical Association state its policy with respect to diminution of the reservoir of requisitions of volunteer medical personnel emanating from a foreign source; therefore be it

*Resolved*, That the House of Delegates instruct the Board of Trustees of the American Medical Association, after appropriate study, to formulate and express through THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION a guiding policy in this matter.

On motion of Dr. John Z. Brown, Utah, seconded and carried, the House recessed at 12:45 p. m.

## Tuesday Afternoon, June 3

The House of Delegates was called to order by the Speaker at 2:10 p. m.

The Speaker announced that Dr. Holman Taylor, Texas, had been requested to serve as sergeant-at-arms in place of Dr. A. A. Ross, Texas, who was not in attendance.

On motions, duly made, seconded and carried, attendance at the Executive Session was granted to members of the House of Delegates; officers, trustees and persons allied to the administrative affairs of the American Medical Association; presidents, secretaries, executive secretaries and chairmen of councils of constituent state and territorial medical associations; secretaries and executive secretaries of component county medical societies; the liaison officer, Lieut. Col. Charles G. Hutter; the attorney for the American Medical Association; the secretary of the Canadian Medical Association, and the secretary of the Southern Medical Association.



## Executive Session—Tuesday Afternoon, June 3

The Sergeants-at-Arms polled the House, after which the House went into Executive Session at 2:20 p. m., with Dr. H. H. Shoulders, Speaker, presiding.

### Report of Board of Trustees

Dr. Arthur W. Booth, Chairman, presented the following report of the Board of Trustees, which was referred to the Reference Committee on Executive Session:

#### INDICTMENT AND TRIAL OF THE

AMERICAN MEDICAL ASSOCIATION, THE MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA, HARRIS COUNTY (TEXAS) MEDICAL SOCIETY, WASHINGTON (D. C.) ACADEMY OF SURGERY AND TWENTY-ONE INDIVIDUAL DOCTORS, ALLEGED TO BE MEMBERS AND OFFICERS OF THE AFORESAID MEDICAL ASSOCIATION AND SOCIETIES, IN THE CASE ENTITLED UNITED STATES OF AMERICA VERSUS AMERICAN MEDICAL ASSOCIATION ET AL., DISTRICT COURT OF THE UNITED STATES FOR THE DISTRICT OF COLUMBIA, NUMBER 63221

On Dec. 20, 1938 there was filed in the office of the Clerk of the District Court of the United States for the District of Columbia at Washington, D. C., an indictment by an additional grand jury of the District of Columbia, charging the defendants mentioned in the caption hereof with combining and conspiring together for the purpose of restraining trade in the District of Columbia, in violation of section 3 of the act of Congress of July 2, 1890, known as the Sherman Antitrust Act.

On March 29, 1939 the defendants filed a demurrer to the indictment. The effect of the filing of a demurrer to an indictment is to say that, admitting everything stated in said indictment to be true, no violation of law has been charged.

Written briefs and arguments in support of the demurrer were filed by the defendants, and oral argument thereon was had before the court on various dates. On July 26, 1939 the District Court sustained the defendants' demurrer to the indictment and dismissed the indictment. The District Court filed a written opinion and gave as its principal reason for holding that the indictment did not charge a violation of section 3 of the Sherman Antitrust Law that the practice of medicine was not a trade.

The United States appealed the decision of the District Court to the Court of Appeals of the District of Columbia. While the case was pending in the Court of Appeals of the District of Columbia the United States filed a petition in the Supreme Court of the United States requesting that court to remove the case from the Court of Appeals of the District of Columbia to the United States Supreme Court for decision. The Supreme Court of the United States refused to order the case removed.

Thereafter printed briefs and arguments were filed by both sides in the Court of Appeals of the District of Columbia and in due course oral argument was had before the Court of Appeals. On March 4, 1940 the Court of Appeals filed its decision and written opinion reversing the order of the District Court and ordering that the case be remanded to the District Court for trial. The Court of Appeals in its opinion said that the practice of medicine was a trade.

The defendants filed a petition for certiorari in the Supreme Court of the United States requesting that court to review the decision of the Court of Appeals. The United States in its reply to defendants' petition requested the Supreme Court of the United States not to review the decision of the Court of Appeals at that time on the demurrer but to require the defendants to stand trial and thereafter when all the evidence was in the record to review it if it saw fit to do so. The Supreme Court denied the defendants' petition for certiorari, without an opinion, and as a result the defendants were required to go to trial in the District Court of the United States at Washington, D. C.

On Feb. 5, 1941 the trial began before a jury in the District Court. The trial continued each day until April 4, 1941, when it was concluded. At the conclusion of the evidence for the United States the court directed the jury to return a verdict of not guilty as to Harris County Medical Society, Washing-

ton Academy of Surgery, Dr. Leon Alphonse Martel and Dr. Joseph Rogers Young. At the conclusion of all the evidence the defendants requested the court to direct the jury to find the defendants "not guilty," but the court denied the request and, after instructing the jury as to the law of the case, submitted the case to the jury. The jury found the American Medical Association and the Medical Society of the District of Columbia guilty as charged in the indictment; that is, guilty of combining and conspiring to restrain trade in the District of Columbia. The jury acquitted all of the remaining defendants. Counsel for the two corporations being of the opinion that a verdict which convicted the principal and acquitted the agents through which the principal allegedly acted was a legally impossible verdict, filed motions requesting the court to set aside the verdicts of conviction and discharge the corporations or to grant these corporations a new trial. The court denied these motions on May 29, 1941 and on that day entered judgment on the verdicts against the corporations and assessed a fine against the American Medical Association in the sum of \$2,500 and against the Medical Society of the District of Columbia in the sum of \$1,500.

During the course of the trial the court refused to permit the defendants to prove that Group Health Association, a membership corporation not for profit, organized under the laws of the District of Columbia, received a subsidy of \$40,000 from Home Owners Loan Corporation and other subsidies from private sources; refused to permit the defendants to prove coercion to require employees of various government departments to join Group Health Association; refused to permit the defendants to prove that Group Health Association was guilty of advertising for and soliciting of members; refused to permit the defendants to prove that they had been advised by the best legal talent available that Group Health Association was illegally practicing medicine and engaged in the operation of an insurance company contrary to law, and refused to permit the defendants to prove that Group Health Association and the doctors employed by it were violating the Principles of Medical Ethics of the medical profession. The principal reason given by the court for refusing to permit the defendants to make the aforesaid proof was that even if Group Health Association was violating the law that fact would not authorize or warrant the defendants violating the law in an effort to restrain them and that therefore the proof was immaterial. The court seemed to be of the opinion that if the activities of Group Health Association were contrary to law it was the duty of the public prosecutor to prosecute them and not the privilege of the defendants to attempt to restrain them.

The court submitted to the jury for its determination as a question of fact whether the defendants combined or conspired to restrain trade in the District of Columbia unreasonably and the jury found the two corporations guilty. The court has refused to set the verdicts aside.

The Board of Trustees has been advised by counsel for the American Medical Association that new and novel questions of law are involved in this case and that there is a fair chance that the Court of Appeals of the District of Columbia will decide that the District Court committed reversible error in many of its rulings on the evidence, in refusing to permit the defendants to make proof as hereinbefore stated, in denying the motions of the defendants to direct a verdict in their favor, in certain instructions which it gave to the jury and in denying the motions of the defendants to set aside the verdict of the jury finding the two corporations guilty when the jury had found all the alleged agents of the corporations not guilty. Counsel for the American Medical Association further advise that even should the Court of Appeals refuse to reverse the various rulings of the trial court and grant a new trial there is a fair chance that the Supreme Court of the United States will reverse the previous ruling of the Court of Appeals that the practice of medicine is a trade or will hold that the defendants are in the same class as labor unions and not subject to the provisions of the Sherman Antitrust Law or will hold that the evidence fails to show that the defendants combined and conspired to restrain trade or will hold that the trial court committed reversible error in its rulings during the course of the trial or in its instructions to the jury.

The Board of Trustees recommends to the House of Delegates that counsel for the American Medical Association be requested and directed to appeal the judgment based on the verdict of guilty against the American Medical Association in the case of *United States v. American Medical Association et al.*, District Court of the United States for the District of Columbia, number 63221.

In submitting this report, the Chairman of the Board of Trustees discussed to some extent the possibilities concerning the nature of future developments with respect to the case of the United States versus the American Medical Association et al.

Dr. Booth, on request of the Speaker, presented to the House Mr. E. M. Burke, counsel for the American Medical Association, who outlined the situation with respect to this case.

After discussion, this report of the Board of Trustees, which had been referred to the Reference Committee on Executive Session, was considered by the entire House in executive session, on motion of Dr. Thomas A. McGoldrick, chairman of that reference committee, seconded by Dr. George W. Kosmak, New York, and carried.

Dr. Holman Taylor, Texas, moved that the House of Delegates heartily approve and commend this report of the Board of Trustees, and the motion was duly seconded.

Dr. T. K. Gruber, Michigan, moved that Dr. Taylor's motion be amended by adding to it the statement that the Board of Trustees be instructed by the House of Delegates to direct counsel for the American Medical Association to appeal the judgment, based on the verdict of guilty, against the American Medical Association in the case of *United States v. American Medical Association et al.*, District Court of the United States for the District of Columbia, number 63221, and the amendment was accepted by Dr. Taylor and his second.

After discussion, Dr. Taylor's motion as amended was carried by a rising vote, there being not one dissenting vote.

#### Report and Supplementary Report of Reference Committee on Military Preparedness

Dr. Harvey B. Stone, Chairman, presented the following report of the reference committee:

1. Resolution on Medical Examination of Draftees: The following resolution was considered by your reference committee after a full hearing:

WHEREAS, The Committee on Distribution of Medical Care is fully cognizant of the present national emergency and the request of the federal government to participate in the national defense program, and the usual willingness of physicians to cooperate has been exemplified during the past eight months; and

WHEREAS, The medical profession is still willing to cooperate in this program; and

WHEREAS, The workers on all other government projects are fully compensated for their efforts; and

WHEREAS, The examiners for National Youth Administration, Civil Service and Recruiting Service are compensated for their services; and

WHEREAS, The work of examining draftees requires a great expenditure of time and effort on the part of the examining physician as well as actual cash expense; and

WHEREAS, It appears that this program will continue indefinitely and perhaps permanently; therefore be it

Resolved, That the Committee on Distribution of Medical Care recommends to the Executive Committee of the Council of the Michigan State Medical Society, that it instruct the delegates of that society to the American Medical Association to present on the floor of the House of Delegates of the American Medical Association in 1941 this problem in order that a procedure may be established for compensating the local advisory and draft board examiners for their physical examination of draftees.

Communication Concerning Uncompensated Services Rendered by Physicians to the Selective Service: The following communication was also considered by your reference committee at the time it considered the Resolution on Medical Examination of Draftees:

At a recent meeting of the Arkansas Medical Society, communications from different sections of the state were presented protesting the uncompensated services being rendered by physicians to Selective Service.

It is not unusual for a physician in this capacity to be asked to examine from six to ten men in one day, using his own office and office equipment and taking the time that often his pay patients want. Thus he is not only donating his services but also paying for the privilege of doing so in lost fees.

In the districts of some advisory boards no "specialists" in eye, nose and throat, etc., reside and draftees are sent to medical advisory boards in other districts for such examinations, thus requiring the physicians on such boards to do the work not only from their own district but from other districts as well.

Selective Service is functioning more nearly perfectly than any other branch of the preparedness program, and no small share of the honor for its success is due to the work of physicians.

We have a communication from one who has discussed this matter with the Committee on Military Affairs of the House of Representatives in Congress, which says "this condition exists largely because of the fact that various medical associations agreed on behalf of their members to perform this service free of charge as a patriotic contribution to the defense program." If this is true, we feel sure that the heads of "various medical associations" made such an agreement without giving serious thought as to the time and financial loss required of the physicians who do the work.

We feel that any action asking for an adjustment of this condition should come from organized medicine and we are therefore appealing to the American Medical Association asking that such action as is deemed expedient be taken to call to the attention of the War Department the amount of work now being done by physicians gratis and ask a correction of the injustice by (1) giving remuneration to the physicians who serve as examining physicians and medical advisory board members for actual time employed, making it retroactive to include work already done, or (2) equipping an office in each local board office, or county or district and furnishing a full time medical officer who would do all the examining. This would not necessitate a medical officer for each board as one medical officer could serve several boards.

S. J. ALLBRIGHT, M.D. }  
L. T. EVANS, M.D. } Special Committee.  
C. E. DUGAN, M.D. }

ARKANSAS MEDICAL SOCIETY.

Since there are many laymen, many more in fact than physicians, serving the Selective Service in various capacities without payment, who comprise the members of the local boards, the appeals boards, the government appeals agents and others in ancillary capacities, it would be against the adopted policy of the American Medical Association to recommend that physicians serving these local boards be paid, because the American Medical Association has pledged its utmost service to the government in behalf of the national defense program. To pay the physicians would make these positions political in intent and practice.

Your reference committee therefore recommends that at the present time the resolution and request in the communication be disapproved.

2. Resolution on Eligibility of Women Physicians and Surgeons for Medical Reserve Corps: The following resolution was considered after a full hearing:

WHEREAS, The United States of America is at present engaged in a vast preparedness program which includes a listing of members in the Medical Reserve Corps available for active service; and

WHEREAS, There are approximately eight thousand women physicians and surgeons in the United States, and women physicians and surgeons of America demonstrated their fitness for wartime service during the first World War when they financed units and staffed hospitals with well trained officers, in France and Serbia; and

WHEREAS, The United States government has to date taken no cognizance of these women physicians in time of national emergency; and

WHEREAS, The government has already granted women nurses Army rating with proper rank, pay, and war-risk insurance; and

WHEREAS, The Medical Society of the State of New York has gone on record recommending that the women physicians and surgeons of America be made eligible for the Medical Reserve Corps of the United States Army and Navy and be granted full privileges thereof; therefore be it

Resolved, That the American Medical Association go on record to this effect, and that a request go to the Surgeon Generals of the Army and the Navy to make women physicians and surgeons of the United States eligible for the Medical Reserve Corps of the Army and the Navy with full privileges thereof.

The hearing developed the fact that legislation by Congress would be required to effect this change in the qualification of medical reserve officers by amending the present law and adding "female" to the present legal qualifications for a commission in the Medical Reserve Corps. After hearing from the representatives of the Surgeon General of the Army and listening to other statements, this reference committee feels that it would not be to the best interests of the defense program to advocate legislation at this time. In addition to the changes in regulations and laws, it would demand reconsideration of the program for construction of military hospitals in addition to changes in the plans for housing of officers. This would hamper and immediately throw into confusion existing procedures under which the medical aspects of the defense program are developing. From a larger point of view the necessary absence of so many male physicians from civilian areas will give opportunity to eight thousand women physicians for a full task and make theirs a valuable patriotic contribution should they focus their activities on service to the civilian population. Moreover, they may apply for positions in the U. S. Public Health Service, in which many vacancies exist and in which their services can be utilized without resort to legislation.

Your reference committee therefore recommends that the propositions advocated in the resolutions from the delegations from New York and Pennsylvania<sup>1</sup> be disapproved at this time.

**3. Resolution on Patriotic Services of Native American and Foreign Born Physicians:** The following resolution concerning refugees from foreign lands, who for the most part have first citizenship papers, received sympathetic attention and consideration from your reference committee:

WHEREAS, The regulations for the granting of commissions in the armed forces of the country exclude foreign born physicians and also to an extent native American doctors who are graduates of foreign medical schools; and

WHEREAS, These regulations thus enforced work an undue hardship on the patriotic native members of our profession who leave their homes, institutional positions and private practices to perform full military duty, thus placing their civilian status and practice in the hands of those to whom the high privilege of service is denied by the aforesaid regulations; and

WHEREAS, There may be found places where these foreign born physicians may serve the country, which would in no way be considered by proper authority as "key positions," and such service in such non-key positions would not entail any risk to the security of our national defense; and

WHEREAS, The house of delegates of the Medical Society of the State of New York has instructed its delegation to the House of Delegates of the American Medical Association to present these facts for consideration and action; therefore be it

Resolved, That the American Medical Association make proper representation to the federal authorities concerned with these matters to the end that the patriotic contributions of military service by native American physicians, graduates of grade A medical schools, be not a handicap to them, throughout and after their period of service, by the loss of their practices and hospital associations because these were taken over by the men from whom the privilege to serve the government is withheld.

The Surgeon Generals of the Army and Navy are debarred by regulations from granting commissions to foreign physicians. It is comprehended that their presence in the civilian community constitutes a handicap not only to our native physicians who are called on to serve but in many instances to these newly adopted citizens who are desirous of proving their entire devotion to this country, whose open handed hospitality has sheltered them from oppression. Your reference committee feels that this subject has many aspects which need more study to the end that proper disposition may be made of these physicians from foreign shores who are recently arrived among us and recommends that this matter be referred to the Committee on Medical Preparedness of the American Medical Association, with the hope that some type of service may be found wherein these men may serve this government without necessarily being commissioned as medical officers in our armed forces.

**4. Resolution on Continuation of Supply of Well Trained Medical Graduates:** The following resolution was thoroughly discussed:

WHEREAS, The experience of belligerent nations in the World War and in the present conflict amply demonstrates the necessity of insuring a continuing supply of well trained medical graduates; and

WHEREAS, There will probably be a shortage of medical men necessary for the proper functioning of the military services and for the care of the civilian population; and

WHEREAS, The United States Army in 1917-1918 permitted medical students in active military service to be transferred to the reserve for the purpose of completing their medical course; and

WHEREAS, A number of medical students were already inducted into service before the issuance of the recent Selective Service regulations authorizing deferment of medical students and premedical students already matriculated in medical schools; and

WHEREAS, The Medical Society of the State of New York, with these facts in mind, instructed its delegates to the American Medical Association to introduce a resolution memorializing the Surgeon General of the Army to give consideration to medical students already inducted into active service in the present emergency; therefore be it

Resolved, That the American Medical Association memorialize the proper military authorities and the Director of Selective Service to release those medical students already inducted into service and enable them to return for completion of their medical studies.

Information at hand shows that exceedingly few medical students have been inducted into the army. The deferment of medical students and premedical students who have successfully completed their courses is already being provided for by the national Selective Service System. Your reference committee feels that it is a matter requiring continuing study and observation to watch the effects of the recommendations of the national Selective Service System on the local boards throughout the country and that any action at this time would be

1. There is no record in the official minutes of the presentation to the House of a resolution from Pennsylvania on this subject.

premature, particularly since the trend of the attitude of the War Department and the national Selective Service System is definitely toward the conservation of medical talent and the encouragement of the continued pursuance of premedical and medical courses as occupations in the interest of the safety and health of the nation.

Your reference committee therefore recommends that no action be taken on this resolution at this time, and that the resolution be tabled.

Respectfully submitted.

HARVEY B. STONE, Chairman.

JAMES E. PAULLIN.

SAMUEL J. KOPETZKY.

SAM E. THOMPSON.

JOHN H. O'SHEA.

E. H. SKINNER.

JOSEPH F. SMITH.

Dr. Stone then presented the following supplementary report of the reference committee:

Resolution on Appeal of British Red Cross for American physicians: A resolution from New York State introduced at the end of this morning's session concerns the attitude of the American Medical Association toward the sending of volunteer medical personnel for service with foreign nations. It recommends that the House of Delegates authorize the Board of Trustees of the American Medical Association after appropriate study to formulate and express through THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION a guiding policy in this matter. The chairman of your reference committee reports that it has been impossible to arrange a formal meeting of the committee to consider this matter, but that five of the members personally have approved of the resolution and it is therefore recommended that the resolution be adopted.

HARVEY B. STONE, Chairman.

On motions of Dr. Stone, duly seconded and carried, each of the four sections of the report of the reference committee was adopted after discussion.

Dr. Stone moved the adoption of the supplementary report of the reference committee, and the motion was seconded by Dr. Arthur T. McCormack, Kentucky. After discussion, the House adopted a motion, duly seconded and carried, to amend the supplementary report of the reference committee to indicate that the resolution referred to in it should be adopted with the omission of the "whereases." The supplementary report of the reference committee as amended was then adopted.

On motion of Dr. Stone, seconded by Dr. H. B. Everett, Tennessee, and carried, the report and the supplementary report of the reference committee as amended were adopted as a whole.

#### Vote of Appreciation

On motion of Dr. James Q. Graves, Louisiana, seconded by Dr. Arthur J. Bedell, Section on Ophthalmology, and Dr. Thomas K. Lewis, New Jersey, and carried, a rising vote of appreciation was extended to Mr. E. M. Burke.

It was moved by Dr. R. W. Fouts, Nebraska, seconded by Dr. George W. Kosmak, New York, and carried, that the House rise from executive session and continue in regular session.

The executive session adjourned at 4:35 p. m.

#### Tuesday Afternoon (Continued)

The House reconvened in regular session at 4:35 p. m. with Dr. H. H. Shoulders, Speaker, presiding.

#### Proposed Amendment to Constitution

Dr. William R. Molony Sr., California, in behalf of Dr. E. H. Cary, Texas, presented the following proposed amendment to the Constitution, which must lie over for consideration at the annual session of the House in 1942:

WHEREAS, The Board of Trustees of the American Medical Association was set up at a time when numerically the Association was approximately one-third its present strength; and

WHEREAS, Because of the great variety of conditions existing throughout the country, largely because of geographic and population problems, it seems desirable to provide a greater spread of membership for the Board, even though it is not at all a matter of representation in the sense that the House of Delegates is a representative body; therefore be it

*Resolved*, That article 6, section 1 of the Constitution of the American Medical Association be amended by substituting the word "eleven" for the word "nine" as the last word of the fourth line of that section, so that article 6, section 1, will then read: "SECTION 1.—The general officers of the Association shall be a President, a President-Elect, a Vice President, a Secretary, a Treasurer, a Speaker and a Vice Speaker of the House of Delegates, and eleven Trustees"; and be it further

*Resolved*, That article 6, section 1 of the Constitution of the American Medical Association be amended to read as follows:

"SEC. 3.—Two Trustees shall be elected annually except every fifth year, when three shall be elected, each to serve for five years; or until his successor is elected and installed: Provided, that at the session of the House of Delegates at which this amendment is adopted three Trustees shall be elected to serve five years and one to serve four years. No Trustee shall serve for more than two consecutive terms, but a Trustee elected to serve an unexpired term shall not be regarded as having served a term unless he has served three or more years."

#### Report of Reference Committee on Hygiene and Public Health

Dr. Arthur T. McCormack, Chairman, presented a report, which as amended reads:

Your reference committee has read, with interest, the report of the Council on Medical Education and Hospitals in regard to medical students and interns and recommends that this portion of the report of the Council be approved and that the deans of medical schools and the staffs of approved hospitals provide for regular health examinations and annual reexaminations for all medical students and interns.

Respectfully submitted.

ARTHUR T. McCORMACK, Chairman.  
WARREN F. DRAPER.  
LEWIS B. BATES.  
L. W. LARSON.  
WILLIAM D. JOHNSON.

It was moved by Dr. McCormack and seconded by Dr. Fred-eric E. Sondern, New York, that the report of the reference committee be adopted. On motion of Dr. R. W. Fouts, Nebraska, duly seconded and carried, the word "annual" was inserted before "reexamination" in the last sentence. The report as amended was then adopted.

#### Appreciation of American Medical Women

Dr. Harry H. Wilson, California, moved that the House go on record as applauding and appreciating the spirit of the American medical women in offering services to the United States government, and the motion was seconded by Dr. Arthur T. McCormack, Kentucky, and Dr. Walter E. Vest, West Virginia, and adopted unanimously.

On motion of Dr. Edward M. Palette Sr., California, duly seconded and carried, the House recessed at 4:45 p. m. to reconvene at 1 p. m., Thursday, June 5, 1941.

### Third Meeting—Thursday Afternoon, June 5

The House of Delegates was called to order at 1:05 p. m. by the Speaker, Dr. H. H. Shoulders.

#### Report of Reference Committee on Credentials

Dr. G. Henry Mundt, Chairman, stated that a total of 171 delegates had been seated.

#### Roll Call

The Secretary called the roll and announced that more than a quorum had responded.

#### Presentation of the Minutes

It was moved by Dr. Arthur T. McCormack, Kentucky, seconded by Dr. E. G. Wood, Tennessee, and carried, that the House dispense with the reading of the minutes.

#### Report of Board of Trustees

Dr. Arthur W. Booth, Chairman, presented the following report, which was adopted on motions duly seconded and carried:

1. Resolution Authorizing Establishment of a Health Exhibit for the Public at Cities Where Annual Sessions are Held: The Board of Trustees is in full sympathy with the objectives of the California Medical Association in stressing the importance of the education of the general public in problems of health and sound principles of medical practice by the use of exhibit material. It has on several occasions devoted consid-

erable time to the question of how exhibit material such as appears in the Scientific Exhibit at the annual sessions might be utilized. However, after careful consideration the utilization of this material has not been found feasible, for several reasons: i. e., the material belongs to the exhibitors, and most of it is not pointed suitably toward the lay public; it is scientific in nature and would not be practical for use for public education unless some one was in attendance to explain it. It is indeed doubtful that the exhibitors would go to the city at which an annual session is held a week in advance of the session or remain a week after its close to demonstrate to the public, but, if they agreed to do so, their expense would have to be defrayed.

The Academy of Medicine of Cleveland has provided a health exhibit during the meeting of the American Medical Association, and the Bureau of Exhibits in the headquarters office has furnished material for exhibits in various parts of the country. The advantages of permanent health exhibits are well recognized. Such exhibits are maintained in Chicago, New York, Pittsburgh, Cleveland, and Rochester, N. Y.

The Board will be glad to bear in mind the desirability of fostering such exhibits as opportunity is offered.

2. Resolution Requesting Appointment of Committee to Confer with Specialty Boards: Concerning the resolution with regard to specialty boards, the Board of Trustees feels that this is a matter that cannot be acted on precipitately. The Board will study the records, develop all the facts by proper conferences, in cooperation with the Council on Medical Education and Hospitals and the Specialty Boards, and will try to work out a plan for presentation later to this House.

Respectfully submitted.

ARTHUR W. BOOTH, Chairman.

#### Report of Reference Committee on Medical Education

Dr. Walter G. Phippen, Chairman, presented the following report, which was adopted on motion of Dr. Phippen, seconded by Dr. Arthur T. McCormack, Kentucky, and carried:

Your Reference Committee on Medical Education held a hearing to consider the supplementary report of the Council on Medical Education and Hospitals regarding the essentials of an acceptable school for clinical laboratory technicians. Members of the Council appeared before it as did many others who were interested in the subject, and the essentials were thoroughly discussed and changed in some respects by your reference committee to read as follows:

#### ESSENTIALS OF AN ACCEPTABLE SCHOOL FOR CLINICAL LABORATORY TECHNICIANS PREAMBLE

Two organizations are primarily concerned with the training of clinical laboratory technicians: the Council on Medical Education and Hospitals of the American Medical Association and the Board of Registry of Medical Technologists of the American Society of Clinical Pathologists. The Council functions by inspecting, reporting and approving these schools, while the Board of Registry investigates and certifies the competence of the technicians.

The Council, with the cooperation of the Board of Registry, has promulgated standards for this type of training for the information of physicians, hospitals, prospective students and others and for the protection of the public.

Technicians are being trained in these schools to work under the direction of qualified physicians and not as independent practitioners of laboratory work.

#### I. ADMINISTRATION

1. Acceptable schools for training laboratory technicians may be conducted by general hospitals or state health laboratories affiliated with hospitals where the majority of the student's practical training is received. This arrangement should not discourage affiliations between the hospital and universities, colleges, public health laboratories or other hospitals.

2. All training of technicians shall be under competent medical control.

3. Resources for continued operation of the school should be insured through regular budgets, gifts or endowments but not entirely through students' fees. Experience has shown that

commercial schools operated for profit frequently do not adhere to proper ethical and educational standards and therefore are not acceptable.

## II. ORGANIZATION

1. Adequate space, light and modern equipment should be provided in the laboratory department. A library containing up to date references, textbooks and scientific periodicals pertaining to clinical laboratory work and pathology should be maintained or be readily accessible in the institution.

2. Satisfactory record systems should be provided for all work carried on in the department. Monthly and annual classifications of the work of the department should be prepared.

3. Transcripts of high school and college credits and other credentials must be available. Records should be kept of each student's attendance and grades as well as of the number and type of tests performed. In addition a synopsis of the complete curriculum should be on file in the office of the laboratory director. This curriculum should include the rotation of assignments, the outline of instruction supplied by the laboratory and a list of the prepared specimens which are used to augment the experiences of the student.

4. At least two or more students should be enrolled in each class. Approval is automatically withdrawn if a school does not have any students for a period of two years, unless a satisfactory reason for this is given.

## III. FACULTY

1. The school should have a competent teaching staff. The director must be a graduate in medicine who holds the certificate of the American Board of Pathology or who has had the equivalent in training and experience. He should take part in and be responsible for the actual conduct of the training course. He should be in daily attendance for sufficient time to supervise properly the laboratory work and teaching.

2. In laboratory practice the enrolment should not exceed one student to each member of the teaching staff. The staff should include not less than one salaried instructor who is a registered technician or eligible for registration, in addition to the laboratory director. In order to be considered as an instructor, a technician must have had three years of experience, while members of the hospital staff or visiting instructors must have regular assignments that cover a complete course prescribed in the Essentials.

## IV. PREREQUISITES FOR ADMISSION

Candidates for admission should be able to satisfy one of the following requirements:

(a) Two years of college work, including chemistry and biology at an accredited college or university. After Jan. 1, 1943 this requirement shall read: Two years of college work, including general chemistry, quantitative chemistry, and biology at an accredited college or university. Bacteriology may be substituted for biology. Organic chemistry and physics are highly recommended.

(b) Graduation at a school of nursing recognized by the state board of nurse examiners and, in addition, college chemistry. After Jan. 1, 1943 requirements for nurses shall include one year of college work, thirty semester hours (forty-five quarter hours) including courses in chemistry and biology.

## V. CURRICULUM

1. The course of training should be not less than twelve months in duration and should include the following subjects: biochemistry, hematology, bacteriology, parasitology, histology and serology. The training should also include a course in record keeping.

2. The instruction should follow a planned outline similar to the Model Curriculum of the Board of Registry of Medical Technologists and should be accomplished by text assignments, lectures or informal discussions, demonstrations, supervised practice, quizzes and written, oral and practical examinations.

## VI. CLINICAL MATERIAL

Each student should receive practice training, adequate in kind and amount, under competent supervision, in a hospital laboratory. The hospital should be registered and be otherwise acceptable to the Council on Medical Education and Hos-

pitals of the American Medical Association and have a minimum of two thousand yearly admissions. A sufficient amount of clinical material should be available to permit the student to comply with the requirements of the Board of Registry. If the hospital is not able to supply all this material through its routine tests and examinations, artificial mediums should be provided.

## VII. ETHICS

1. Exorbitant fees and commercial advertising should be considered unethical.

2. Schools conducted primarily for the purpose of substituting students for paid technicians will not be considered for approval.

Respectfully submitted.

WALTER G. PHIPPEN, Chairman.  
ELBRIDGE J. BEST.  
CARL R. STEINKE.  
LOUIS A. BUE.  
WINGATE M. JOHNSON.

## Report of Reference Committee on Legislation and Public Relations

Dr. Henry A. Luce, Chairman, presented the following report, which, on motions of Dr. Luce, duly seconded and carried, was adopted section by section and as a whole:

1. Report of Committee on Legislative Activities on Senate and House Bills Indicated: Your reference committee wishes to note that portion of the report on S. 1230 with its reference to sectarian medicine. This was condemned at the New York session last year and your reference committee recommends a reaffirmation of the action then taken; namely, "Your reference committee believes that the reference to osteopathic representation on the council is entirely unwarranted and should be eliminated from the bill."

H. R. 4476, which, as amended, contains similar reference to sectarian participation, is likewise placed by your reference committee in the same category.

Referring to the \$150,000,000 Lanham bill, known as H. R. 4545, which provides for the construction of public works made necessary by the national defense program, including the construction of hospitals and other facilities for the care of the sick, your reference committee commends the action of the Committee on Legislative Activities in calling attention to the necessity of exercising constant vigilance to the end that no feature objectionable to public health be instigated.

2. Report of Committee on Legislative Activities on Farm Security Administration Policies: Regarding the Farm Security Administration policy of arriving at understandings with constituent state medical societies as arranged by Dr. R. C. Williams, chief medical officer, prior to making contracts, this procedure is in line with good public policy and in harmony with recommendations of the American Medical Association. For this activity on the part of Dr. Williams, your reference committee wishes to express highest approval.

Your reference committee wishes to call attention to that portion of the report of the Committee on Legislative Activities which reads: "Your committee has had called to its attention a new plan proposed in Oregon which involves creation of corporations controlled by laymen clients of the Farm Security Administration whose stockholders receive benefits of medical care. While the present limitation of participating stockholder to the Farm Security Administration clients does not change the present practice so far as medical benefits are concerned, your committee deplores any development called to its attention which would permit later amendment of the by-laws of the corporation to include other than Farm Security Administration clients contrary to the principles of the American Medical Association and the expressed policies of the Farm Security Administration to cooperate fully with state and county societies through unincorporated groups."

Your reference committee disapproves of the development of any plan whereby nonmembers of the Farm Security Administration can be included in the development of any plan not approved by constituent state medical societies.

Your reference committee notes with pleasure the report of the rehabilitation work done under the supervision of



Dr. Williams. Any attempt to restore health and self respect to American families and to preserve individuality, independence and security is to be commended.

Your reference committee is impressed with the problems presented by migrant individuals in various sections of the country as well as with the "mushroom" communities incident to the erection of defense industries. Awareness of potentially dangerous conditions is essential. It recommends that state and local medical societies become alert to their responsibilities and anticipate the public health problems therein involved.

In conclusion your reference committee quotes, with emphasis, the final paragraph of the report of the Committee on Legislative Activities: "Your committee concludes this report by appealing to a unified profession to continue its interest in the attitude of its own representatives in Congress so that any sound program can be supported and any program which makes undue inroads into the private practice of medicine can be opposed."

Respectfully submitted.

HENRY A. LUCE, Chairman.  
F. J. PINKERTON.  
JOHN H. FITZGIBBON.  
TERRY M. TOWNSEND.  
F. S. CROCKETT.

#### Report of Reference Committee on Miscellaneous Business

Dr. Charles G. Strickland, Chairman, presented the following report:

Your reference committee's meeting room was simply crowded with observers and participants on Tuesday afternoon. Your reference committee was most pleased and gratified at the interest shown in its proceedings and wishes to thank all who took the trouble to attend. It was a grand but always a good natured riot.

1. Resolution on Hospital Privileges for General Practitioners: You will remember this resolution, which was presented to the House of Delegates, referred to this reference committee and referred back to this reference committee for further consideration. Your reference committee has now given further consideration to the matter and believes that the resolution, and particularly its preamble, as drawn, contains too much controversial material to warrant the requested transmission by this House of Delegates. It further believes that in the present form the resolution fails to accomplish the purpose of its sponsors and therefore recommends that this resolution be returned to the Michigan State Medical Society for further consideration and revision.

2. Resolution on Serologic Tests for Syphilis: Your reference committee is informed that a tremendous amount of work has been done on this subject by the U. S. Public Health Service, all of which is in printed form and available on application to the proper authorities. Dr. Parran has made for himself an international reputation on the subject of syphilis. He has associated himself with advisory commission after advisory commission, made up of men most expert in all phases of syphilis, and their findings are a matter of record and available on request. Under these circumstances, your reference committee has no alternative except to recommend that this resolution be rejected.

3. Resolution on Certification in Recognition of Special Qualifications for General Practice: Your reference committee feels that this resolution carries the certification idea a bit too far. Once a medical graduate has passed his state or national board and has been licensed to practice, he is to all intents certified for general practice. From there on, unless he aspires to specialization, recognition must come from the reputation he builds and the place he makes for himself in the hearts of his loyal patients and in his own community. What can empty honors mean to him or a certification which means little and achieves less? After all, is not a good general practitioner the grandest thing in the world of medicine anyway?

Your reference committee has become aware that certification boards are becoming a sore spot in our medical body. It believes that certification boards have their proper place and function, but evidence of unnecessary irritation among the rank and file is becoming evident. It hopes that the House of De-

gates will not feel that this reference committee is exceeding its functions if it suggests that the Council on Medical Education and Hospitals may have made a mistake in permitting the specialty boards to slip out from under the control and jurisdiction of the American Medical Association. Perhaps it is not too late, by proper contact methods, to reestablish such control. Meanwhile your reference committee regrets that it cannot recommend for approval the resolution suggesting a certification board for general practitioners.

4. Resolution on Establishment of Central Institute for Research in Nervous and Mental Diseases in the U. S. Public Health Service: Dr. Draper of the Public Health Service attended your reference committee's hearing and explained the plan of the U. S. Public Health Service in detail. This service is authorized to study diseases of mankind.

An eminent advisory council has advised of the need of research in mental and nervous diseases. According to the plan, the Surgeon General proposes to request an appropriation from Congress to finance this research. If such funds are appropriated, the Surgeon General, with the aid of a National Advisory Research Council, proposes (1) to establish a special pavilion in connection with St. Elizabeth's Hospital, Washington, D. C., to care for 200 mental and nervous patients. These patients will be selected from individuals already eligible for government care; (2) to establish the necessary laboratories—biochemical, biologic and pathologic; (3) to make certain grants for private research; (4) to establish certain fellowships, and (5) to act as a coordinator of this research and as a library of results obtained.

It is only fair for your reference committee to remind the House that a similar resolution was defeated at the 1940 session. So far as can now be determined, the cause of this defeat was that (1) the resolution was brought before the House in the final session and consequently had not been studied in detail by a reference committee, and (2) there was in the minds of some delegates a doubt as to the propriety of using government funds for such a purpose. Notwithstanding the action taken at the 1940 session, your reference committee, after careful study, recommends the approval of the resolution as now submitted.

Respectfully submitted.

CHARLES G. STRICKLAND, Chairman.  
FREDERIC E. SONDERN.  
HOLMAN TAYLOR.  
CHARLES E. KIELY.  
ANDREW F. McBRIDE.

The recommendations contained in the first three sections of the report of the reference committee were adopted, on motions of Dr. Strickland, duly seconded and carried.

Dr. Strickland moved the adoption of the fourth section of the report recommending the approval of the establishment of a central institute for research in nervous and mental diseases in the U. S. Public Health Service, and the motion was seconded by Dr. Arthur T. McCormack, Kentucky. After discussion, it was moved by Dr. D. F. Cameron, Indiana, that this section of the report of the reference committee be laid on the table. The motion was seconded by Dr. Arthur J. Bedell, Section on Ophthalmology, and carried.

On motion of Dr. Strickland, seconded by Dr. Robert E. Schlueter, Missouri, and carried, the report of the reference committee with the exception of the fourth section which was tabled was adopted as a whole.

#### Report of Reference Committee on Executive Session

Dr. Thomas A. McGoldrick, Chairman, presented the following report, which was adopted section by section and as a whole on motions of Dr. McGoldrick, duly seconded and carried:

1. Report of Committee on Legislative Activities Dealing with Veterans' Hospitals: Your reference committee reaffirms the belief that no hospital should be created nor any present one expanded under the Veterans' Administration Act unless there is proved need for such facility in the community, and that need should be determined after consultation of the government representatives with the medical profession in the area of the proposed project.

Your reference committee urges that the committee of this association in charge of the subject of Veterans' Hospitals and

care, despite the difficulties of opposition, continue its watchfulness and reports.

2. Report of Council on Foods and Nutrition Dealing with the National Nutrition Conference for Defense: Your reference committee believes that the resolution contained in this report should be approved.

3. Resolution Requesting Establishment of Procurement and Assignment Agency: Your reference committee agrees that the establishment of such a central authority will facilitate the work of the Committee on Medical Preparedness and will enable the government to select more promptly and more wisely those physicians necessary for military, civilian and industrial service.

4. Statement on Training of Physicians: Your Reference Committee on Executive Session approves this statement on the training of physicians prepared by the joint conference of the Committee on Medical Preparedness and the Council on Medical Education and Hospitals of the American Medical Association and recommends its transmission to the Secretary of War and to the Surgeon General of the Army.

5. Report of Committee on Medical Preparedness: With the printed report of the Committee on Medical Preparedness in the hands of each delegate and filed with this Association, your reference committee feels that the amount of work therein recorded, the quality of it, the thoroughness and the value thereof are apparent to all and need here no further words of appreciation. The report itself tells of the several meetings of the committee composed of members from different parts of this country, of the conferences held with chairmen of state and county committees on medical preparedness, of conferences with government officials of the Army, the Navy, the Public Health Service and the Selective Service System and with members of the Board of Trustees of the American Medical Association. Many of these conferences were held in Washington, D. C., and at the Association's offices in Chicago.

Your reference committee notes the number of questionnaires distributed to doctors of this country—one hundred and eighty thousand—and the number returned, approximately one hundred and fifty thousand—which have been studied, classified and filed. The cards of these questionnaires make the basic information immediately available and of great assistance to the government when needed for military or civilian service.

Your reference committee especially approves the resolutions forwarded to the federal government urging that arrangements be made under which our medical schools could continue to operate to the highest possible advantage; that medical students, interns and residents be permitted to complete their training in hospitals, and that neither essential teaching personnel nor student bodies be depleted to an extent that would interfere with the production of an adequate supply of well trained graduates each year.

Many of the changes which have already been made in the regulations of the Selective Service Act have undoubtedly been the result of the influence of this Committee on Medical Preparedness.

In addition to other duties, the Committee on Medical Preparedness has kept its eyes on legislation in Congress bearing on medical aspects of national defense and on the standing of pending bills and the possible effects of their enactment.

Your reference committee heartily agrees with the Committee on Medical Preparedness in its appreciation of the valuable assistance rendered by the liaison officer of the Medical Corps, Lieut. Col. Charles G. Hutter, M. C., U. S. Army, namely, Colonel Hutter has won the respect and the esteem of all who have been associated with him.

The report of the Committee on Medical Preparedness indicates the fulfillment of those promises made by the House of Delegates at the 1940 session in New York and the assurance to the government of continued complete support and cooperation.

Respectfully submitted,

THOMAS A. MCGOLDRICK, Chairman.  
DERRING G. SMITH.  
E. S. HAMILTON.  
E. G. WOOD.  
JAMES R. MILLER.  
C. H. HENNINGER.

## Address of Dr. Miguel Acuna

The Secretary stated that he had a communication from the Secretary-General of the Chilean Medical Association announcing the appointment of Dr. Miguel Acuna as its official representative to the annual session of the American Medical Association, as well as a letter from the Honorable R. Michel, Chilean Ambassador.

The Secretary, on request of the Speaker, conducted Dr. Miguel Acuna to the platform, after which Dr. Acuna addressed the House as follows:

*Mr. President, Mr. Speaker, Members of the House of Delegates:* It is a great honor for me to thank you for the cordial invitation received from the American Medical Association to attend the Ninety-Second Annual Session in Cleveland.

The Chilean Medical Association, informed about this invitation, has conferred on me its official representation.

The great development of American medicine is well known and admired in my country. With special sympathy we have witnessed how you have become leaders in the world. Naturally, we hope to have the opportunity to meet American medical men and to know their institutions at first hand.

It is a privilege for me to have visited, during the last eight months, various medical centers of the United States, and I have learned many things. I am glad to state that I have found that the reality exceeds my own expectations through my readings.

Furthermore, as a final crown, I am attending the annual session of the American Medical Association, which constitutes the most outstanding event of medical progress for the enlightenment and benefit of all nations and to the great honor of American medicine. On my return home it will be my purpose to intensify our cultural relations and to study the ways and means by which this can be accomplished, as well as to avoid the problem that existed until the outbreak of the war, namely, that, economically speaking, Chile and other South American nations were further removed from the United States than from Europe, in spite of the geographic reality and the common interests of the Americas.

The Chilean Medical Association desires to maintain cordial relations with your great organization, and it is a pleasure for us to do homage to the American Medical Association and to extend our best wishes for permanent prosperity and success in fulfilling its high ideals of scientific advancements and unselfish services to the community.

I thank the House of Delegates for the invitation to attend its meetings and for the opportunity of expressing my friendship. Thank you.

## ELECTION OF OFFICERS

The Speaker declared the next order of business to be the election of officers.

### Election of President-Elect

Dr. Arthur T. McCormack, Kentucky, nominated for President-Elect Dr. Fred W. Rankin, Lexington, Ky., and the nomination was seconded by Dr. A. W. Adson, Minnesota; Dr. James E. Paullin, Section on Practice of Medicine; Dr. E. G. Wood, Tennessee; Dr. James Q. Graves, Louisiana; Dr. E. H. Cary, Texas; the delegates from the Washington State Medical Association; Dr. Louis A. Buie, Section on Gastro-Enterology and Proctology; Dr. J. Newton Hunsberger, Pennsylvania; Dr. J. N. Baker, Alabama; Dr. Felix J. Underwood, Mississippi; Dr. Walter G. Phippen, Massachusetts; Dr. Henry Cook Macatee, District of Columbia; Dr. William H. Myers, Georgia; Dr. Walter E. Vest, West Virginia; Dr. Edwin S. Hamilton, Illinois; Dr. F. S. Crockett, Indiana; Dr. Thomas F. Thornton, Iowa; Dr. Samuel J. Kopetzky, New York; Dr. William Weston, Section on Pediatrics, and Dr. A. A. Walker, Alabama, who moved that the nominations be closed. The motion was seconded by Dr. Clyde L. Cummer, Section on Dermatology and Syphilology, and carried unanimously. Dr. McCormack then moved that the Secretary cast the ballot of the House for Dr. Fred W. Rankin as President-Elect. The motion was seconded by Dr. H. B. Everett, Tennessee, and carried unanimously.

The Secretary cast the vote of the House for Dr. Fred W. Rankin, Lexington, Ky., for President-Elect of the American Medical Association, and the Speaker declared Dr. Rankin so elected.

Dr. William Weston, Section on Pediatrics, moved that the Speaker appoint a committee to notify Dr. Rankin of this action, and the motion was seconded by Dr. J. N. Baker, Alabama, and carried. The Speaker appointed Drs. Arthur T. McCormack, Kentucky; A. A. Walker, Alabama, and Edward R. Cunniffe, New York, to notify Dr. Rankin of the action taken and to conduct him to the House.

#### Election of Vice President

Dr. James E. Paullin, Section on Practice of Medicine, nominated for the office of Vice President a former member of the House, Dr. Charles A. Dukes, Oakland, Calif., and the nomination was seconded by Drs. Harvey B. Stone, Maryland; Robert A. Peers, California; Henry A. Luce, Michigan; Horace J. Brown, Nevada, and Thomas F. Thornton, Iowa. Dr. Arthur J. Bedell, Section on Ophthalmology, moved that the nominations be closed. The motion was seconded by Dr. Clyde L. Cummer, Section on Dermatology and Syphilology, and carried.

On motion of Dr. W. E. Kittler, Illinois, seconded by Dr. E. H. Cary, Texas, and carried unanimously, the Secretary cast the vote of the House for Dr. Charles A. Dukes, Oakland, Calif., to serve as Vice President of the Association for the ensuing year, and the Speaker declared Dr. Dukes so elected.

The Speaker appointed as a committee to notify Dr. Dukes Dr. James E. Paullin, Section on Practice of Medicine, and Dr. Robert A. Peers, California.

#### Election of Secretary

Dr. William R. Brooksher, Arkansas, nominated Dr. Olin West, Chicago, to succeed himself as Secretary of the American Medical Association, and the nomination was seconded by Drs. Walter E. Vest, West Virginia; Joseph F. Smith, Wisconsin; William Weston, Section on Pediatrics; Andrew F. McBride, New Jersey; Felix J. Underwood, Mississippi; Robert E. Schlueter, Missouri, and H. B. Everett, Tennessee.

Dr. John H. O'Shea, Washington, moved that the nominations be closed. The motion was seconded by Dr. E. G. Wood, Tennessee, and carried.

Dr. O'Shea then moved that the Vice Speaker cast the ballot of the House for Dr. Olin West as Secretary of the American Medical Association for the ensuing year, and the motion was seconded by Dr. H. A. Luce, Michigan, and carried unanimously.

The Vice Speaker cast the vote of the House for Dr. Olin West, Chicago, as Secretary of the American Medical Association for the ensuing year, and the Speaker declared Dr. West elected to the office.

#### Election of Treasurer

Dr. Arthur W. Booth, Chairman, Board of Trustees, nominated Dr. Herman L. Kretschmer, Chicago, to succeed himself as Treasurer of the American Medical Association, and the nomination was seconded by Drs. Robert E. Schlueter, Missouri; Samuel J. Kopetzky, New York; John Z. Brown, Utah, and E. S. Hamilton, Illinois.

On motion of Dr. Samuel J. Kopetzky, New York, seconded by Dr. Burt R. Shurly, Section on Laryngology, Otology and Rhinology, and carried, the nominations were closed.

Dr. Louis A. Buie, Section on Gastro-Enterology and Proctology, moved that the Secretary cast the ballot of the House for Dr. Herman L. Kretschmer as Treasurer of the American Medical Association for the ensuing year, and the motion was seconded by Dr. Olin H. Weaver, Georgia, and carried unanimously.

The Secretary cast the vote of the House for Dr. Herman L. Kretschmer, Chicago, as Treasurer of the Association for the ensuing year, and the Speaker declared Dr. Kretschmer so elected.

#### Address of President-Elect Fred W. Rankin

Dr. Arthur T. McCormack, Kentucky, on behalf of the committee, presented to the House of Delegates the President-Elect of the American Medical Association, Dr. Fred W. Rankin, Lexington, Ky., who addressed the House as follows:

*Mr. Speaker, Members of the House of Delegates:* For the honor you do me in choosing me as your President-Elect for the coming year I am grateful. That this honor does not come to me as an individual but as a representative of a section of the medical profession of the United States I am well aware. I accept this office in a spirit of humility, for as I pass in review the many eminent men who have preceded me in this capacity I am conscious of my unworthiness, and I am also impressed with the feeling of responsibility which this office carries. In these troublous times, the nation as a whole and the medical profession in particular face many and serious problems, and to whatever objectives the medical profession of the United States has dedicated itself I pledge you my sincere cooperation and wholehearted effort.

Gentlemen of the House of Delegates, I thank you again.

#### Election of Speaker of the House of Delegates

Dr. R. W. Fouts, Vice Speaker, took the Chair and stated that the next order of business was the election of a Speaker of the House of Delegates.

Dr. H. B. Everett, Tennessee, nominated Dr. Harrison H. Shoulders, Nashville, Tenn., to succeed himself as Speaker of the House of Delegates, and the nomination was seconded by Drs. Arthur T. McCormack, Kentucky, and William Weston, Section on Pediatrics, after which it was moved by Dr. E. S. Hamilton, Illinois, seconded by Dr. Burt R. Shurly, Section on Laryngology, Otology and Rhinology, and carried, that the nominations be closed.

Dr. Arthur J. Bedell, Section on Ophthalmology, moved that the Secretary be empowered to cast the vote of the House for Dr. Harrison H. Shoulders, Nashville, Tenn., as Speaker of the House of Delegates, and the motion was seconded by Dr. James Q. Graves, Louisiana, and carried unanimously.

The Secretary cast the vote of the House for Dr. Harrison H. Shoulders as Speaker of the House of Delegates for the ensuing year, and the Vice Speaker declared him so elected.

#### Election of Vice Speaker of the House of Delegates

The Speaker resumed the Chair and declared the next order of business to be the election of a Vice Speaker of the House of Delegates.

Dr. E. S. Hamilton, Illinois, nominated Dr. R. W. Fouts, Omaha, to succeed himself as Vice Speaker of the House of Delegates, and the nomination was seconded by Drs. William H. Myers, Georgia; Thomas F. Thornton, Iowa; H. B. Everett, Tennessee; Homer L. Kerr, Missouri; J. Newton Hunsberger, Pennsylvania, and Frank E. Reeder, Michigan.

Dr. Olin H. Weaver, Georgia, moved that the nominations be closed, and the motion was seconded by Dr. Arthur T. McCormack, Kentucky, and carried unanimously.

On motion of Dr. Arthur T. McCormack, Kentucky, seconded by Dr. W. E. Kittler, Illinois, and carried unanimously, the Secretary cast the vote of the House for Dr. R. W. Fouts, Omaha, to succeed himself as Vice Speaker of the House of Delegates for the ensuing year, and the Speaker declared Dr. Fouts so elected.

#### Election of Trustees

##### ADDRESS OF DR. THOMAS S. CULLEN

The Speaker declared the next order of business to be the election of Trustees and requested the privilege of the House to present Dr. Thomas S. Cullen, retiring Trustee who addressed the House as follows:

For years it was my privilege to sit in this House of Delegates, first as a representative of the Section on Obstetrics and Gynecology and later as one of the representatives of our good old state of Maryland.

Twelve years ago I was elected a member of the Board of Trustees, and it has been my good fortune to sit on this Board ever since.

I need say nothing about the House of Delegates, but I have ever been impressed by the sincerity and fairness of its members and by the vast amount they have accomplished in the short time they have been in session each year. The great value of their deliberations has been amply shown by the tremendous advance of the American Medical Association.

As the Trustees are the appointees of the House of Delegates, it is only right and proper that about once in twenty-five years the Trustees should give a short personal, general accounting of their activities in addition to their annual report. As the senior and retiring member, I shall now do so in a few words.

The nine members of the Board of Trustees who have the pleasure of being your representatives between annual sessions come from all parts of the United States. The farthest west has been Portland, Ore.; the farthest east, Boston, Massachusetts.

At nearly every meeting all nine members have been present. The only excuses I have ever heard for their being absent have been either illness or death. The members fully realize that they are your representatives and that they must do their utmost to carry out your wishes. Never in the twelve years have I seen any action taken that did not look to the best interests of American medicine.

In financial matters, Dr. Herman Kretschmer, our Treasurer, and the Finance Committee of the Board, have ever been more solicitous about the Association's funds than they have been about their own. The present financial condition speaks eloquently of this fact.

Day after day for weeks I attended the recent trial in Washington, and after each visit I felt prouder and prouder of the American Medical Association and of the Medical Society of the District of Columbia. I do not see how they could have handled a very difficult situation with more wisdom, with more patience, with more forbearance and with more tact.

The publishing of the entire trial in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION* was a master stroke of statesmanship. The citizens of this country will gradually learn that the American Medical Association, through its various councils, spends hundreds of thousands each year to improve medical teaching, to improve hospital facilities and to protect the citizens of America. In due time the people of this country will begin to realize that the medical profession is in reality their truest friend.

We have in Dr. Olin West one of the best secretaries and general managers that this or any other country has ever seen. How he has accomplished so much is a marvel to the Trustees.

Dr. Morris Fishbein edits the most up to date and far reaching medical journal to be found anywhere in the world.

The Trustees are more than proud of the fine work done by the personnel of headquarters.

Presidents and Trustees of the Association come and go, but the General Manager and the Editor are endowed with perennial youth and continue to carry out the policies of this House of Delegates in a masterly fashion.

The people of the United States have little idea of the vast amount the American Medical Association is at the present moment doing to help the government place this country on a safe and sure foundation.

In years past we have been accustomed to go to the medical centers of Europe for postgraduate work. After this dreadful war is over, it will require many decades before Europe will recover. In the meantime, America must be the mecca for those desiring postgraduate medical training.

We have the men and facilities to undertake this vital work. We may well be thankful and proud that American medicine is so firmly grounded and that her men have in the past added so much to the betterment of mankind. They will do ever more in the future.

Dr. A. R. McComas, Missouri, moved that this address of Dr. Cullen be transmitted to the Secretary and to Dr. Fishbein and through him to the press, and the motion was seconded by Dr. Harry H. Wilson, California, and carried.

#### ELECTION OF TRUSTEE TO SUCCEED DR. AUSTIN A. HAYDEN, DECEASED

The Speaker declared nominations in order for the election of a Trustee to succeed Dr. Austin A. Hayden, deceased, for a term ending in 1943.

Dr. G. Henry Mundt, Illinois, nominated for Trustee Dr. Ernest E. Irons, Chicago, to fill the unexpired term of Dr. Austin A. Hayden, deceased, ending in 1943, and the nomination was seconded by Drs. John Z. Brown, Utah; James E. Paullin, Section on Practice of Medicine; M. de la Pila, Puerto Rico; George P. Johnston, Wyoming, and Walter E. Vest, West Virginia.

Dr. Edward M. Pallette Sr., California, moved that the nominations be closed, and the motion was seconded by Dr. Thomas F. Thornton, Iowa, and carried.

On motion of Dr. G. Henry Mundt, Illinois, seconded by Dr. John Z. Brown, Utah, and carried unanimously, the Secretary cast the vote of the House for Dr. Ernest E. Irons, Chicago, as a member of the Board of Trustees to fill out the unexpired term of Dr. Austin A. Hayden, deceased, ending in 1943, and the Speaker declared him so elected.

#### ELECTION OF TRUSTEE TO SUCCEED DR. THOMAS S. CULLEN

Dr. William H. Myers, Georgia, placed in nomination Dr. Charles W. Roberts, Atlanta, Ga., to succeed Dr. Thomas S. Cullen, Baltimore, whose term expires this year and who, according to the By-Laws, is not eligible for reelection, and the nomination was seconded by Drs. William R. Brooksher, Arkansas; H. B. Everett, Tennessee; W. A. Coventry, Minnesota; Louis A. Buie, Section on Gastro-Enterology and Proctology; Holman Taylor, Texas; Felix J. Underwood, Mississippi; J. Newton Hunsberger, Pennsylvania; James Q. Graves, Louisiana, and Walter B. Martin, Virginia.

On motion of Dr. James E. Paullin, Section on Practice of Medicine, seconded by Dr. J. Newton Hunsberger, Pennsylvania, and carried, the nominations were closed.

Dr. Paullin then moved that the Secretary cast the vote of the House of Delegates for Dr. Charles W. Roberts as Trustee of the Association, and the motion was seconded by Dr. Andrew F. McBride, New Jersey, and carried unanimously.

The Secretary cast the vote of the House of Delegates for Dr. Charles W. Roberts, Atlanta, Ga., as a member of the Board of Trustees for a term of five years, ending in 1946, and the Speaker declared Dr. Roberts so elected.

#### Nominations for Standing Committees

Dr. Frank H. Lahey, President, submitted the following nominations for standing committees, which, on motions duly made, seconded and carried, were confirmed by the House:

Dr. Walter F. Donaldson, Pittsburgh, to succeed himself on the Judicial Council for a term ending in 1946.

Dr. Frederick A. Collier, Ann Arbor, Mich., to succeed Dr. S. P. Mengel, Wilkes-Barre, Pa., on the Council on Scientific Assembly, for a term ending in 1946.

Dr. Arthur W. Booth, Chairman of the Board of Trustees, placed in nomination for membership on the Council on Medical Education and Hospitals to succeed Dr. Fred Moore, deceased, for a term ending in 1948, the following: Dr. Russell L. Haden, Cleveland; Dr. J. Milton Robb, Detroit, and Dr. Harvey B. Stone, Baltimore.

On request of the Speaker, the tellers spread the ballot, and the Secretary announced that 171 delegates had been registered, 160 delegates had been reported present and 142 votes had been cast, of which Dr. Haden received 45, Dr. Robb 32 and Dr. Stone 65.

The Speaker ruled that, since no nominee had received the majority of the votes cast, the name of the nominee receiving the smallest number of votes, namely, Dr. J. Milton Robb, would be dropped and a vote taken on the two remaining nominees.

The tellers again spread the ballot, and the Secretary announced that 160 delegates had been reported present and 139 votes been cast, of which Dr. Haden received 57 and Dr. Stone 82.

The Speaker declared that the House of Delegates had elected Dr. Harvey B. Stone, Baltimore, as a member of the Council on Medical Education and Hospitals, for a term of seven years, ending in 1948.

Dr. Fred W. Rankin, newly elected President-Elect, tendered his resignation as a member of the Council on Medical Education and Hospitals, and Dr. Arthur W. Booth, Chairman of the Board of Trustees, presented the following nominations for membership on that Council to take the place of Dr. Rankin, resigned, for a term ending in 1943: Dr. D. C. Elkin, Atlanta, Ga.; Dr. Russell L. Haden, Cleveland, and Dr. J. Milton Robb, Detroit.

The tellers spread the ballot, and the Secretary announced that 160 delegates had been recorded present and that 138 votes had been cast of which Dr. Elkin received 13, Dr. Haden 107 and Dr. Robb 18.

The Speaker declared that Dr. Russell L. Haden, Cleveland, had been elected a member of the Council on Medical Education and Hospitals to fill the unexpired term of Dr. Fred W. Rankin, resigned, ending in 1943.

#### Election of Affiliate and Associate Fellows

The Secretary presented the following nominations for Affiliate and Associate Fellowship, which, on motions duly seconded and carried, were confirmed by the House:

#### NOMINATIONS FOR AFFILIATE FELLOWSHIP APPROVED BY THE COUNCIL ON SCIENTIFIC ASSEMBLY

Aultz, L. L., Omar, W. Va.	Jelliffe, Smith Ely, New York.
Bates, W. A., Aberdeen, S. D.	Jobse, William, Milwaukee.
Beil, John W., Kansas City, Mo.	Kalayjian, D. S., Parker, S. D.
Bell, George H., New York.	Knowlton, Charles D., Rockport,
Bertling, A. E., Wilmette, Ill.	Mass.
Brown, Samuel Skinner, New York.	Leonhardt, Heinrich, North Tona-
Brown, W. L., El Paso, Texas.	wanda, N. Y.
Burdick, Gordon G., Chicago.	Looze, J. J., Wisconsin Rapids,
Burkhardt, Edward A., Kansas	Wis.
City, Mo.	Malcolm, P. E. D., New York.
Caton, William P., Alexandria, Va.	McEwen, Mary G., Evanston, Ill.
Cheewood, Charles H., New York.	Mohley, J. C., Elizabethtown, Ky.
Clifford, Joseph W., Worthington,	Nichols, Charles B., Auxvasse, Mo.
Ind.	Norwood, M. L., Lockesburg, Ark.
Cohen, Martin, New York.	Onstott, Elmer, Saltsburg, Pa.
Cox, Allen E., Helena, Mont.	Parker, Truman A., La Jolla, Calif.
Cranston, William J., Rockport,	Parrish, John W., Brooklyn.
N. Y.	Pedersen, James, New York.
Curry, Stanton, Peekskill, N. Y.	Pedersen, Victor C., New York.
Dailey, W. G., Millersburg, Ky.	Pierpont, J. Harris, Pensacola, Fla.
De Forest, Henry P., New York.	Pittam, J. Thomas, Kansas City,
Dicus, George A., Streator, Ill.	Mo.
Drumme, N. D., Boston.	Reiche, Cecilia, Los Angeles.
Ellis, Edward F., Fayetteville, Ark.	Ruggles, E. Wood, Rochester, N. Y.
Fischer, Hermann, New York.	Russwurm, W. C., Helena, Mont.
Forbes, Henry H., New York.	Schofield, G. Clarence, Charles-
Frontz, H. C., Huntingdon, Pa.	ton, W. Va.
Funk, Z. E., Santa Rosa, N. M.	Schwab, Leslie W., Chicago.
Gilliam, James C., Des Arc, Ark.	Sheehy, John J., Garrison, N. Y.
Goetchi, H. DuBois, New York.	Skaggs, P. T., Miami, Fla.
Gray, Hugh B., Potter Place, N. H.	Stanton, Florence I., Peekskill,
Grim, Ezra C., Kirksville, Mo.	N. Y.
Hargrave, F. C., Pasadena, Calif.	Stewart, James L., Spearfish, S. D.
Hayd, H. E., Buffalo.	Stewart, William H., New York.
Hendon, G. A., Louisville, Ky.	Strang, W. W., New York.
Hitzel, Gustav A., Buffalo.	Tedford, R. H., Albany, N. Y.
Hoge, M. W., St. Louis.	Theobald, Carl, New York.
Hollister, W. L., Corpus Christi,	Viriden, John E., New York.
Texas.	Walsh, J. H., Campbell, N. Y.
Holmes, Rudolph W., University,	Walton, T. E., Danville, Ill.
Va.	Warbasse, James P., Woods Hole,
Homer, Harry L., Riderwood, Md.	Mass.
Hopkins, Samuel W., Walnut, Ill.	Westman, Carl, Chicago.
Houston, William H., Baltimore.	Wicner, Meyer, St. Louis.
Jacobson, William, New York.	Wolff, Julius, New York.
Jeffries, James L., Spartanburg,	
S. C.	

#### NOMINATIONS OF AMERICAN MEDICAL MISSIONARIES FOR ASSOCIATE FELLOWSHIP APPROVED BY THE JUDICIAL COUNCIL

Adams, Evelyn A., Cameroun, West Africa.  
Burchard, Mary A., Brindaban, United Province, India.  
Foster, L. Paul, Musonia, East Africa.  
Gieser, P. Kenneth, Chin Kiang, Kiangsu, China.  
Hoffman, Rolla E., Meshed, Iran.  
Seamans, Clifford M., French Concession, Tientsin, North China.

#### NOMINATIONS FOR ASSOCIATE FELLOWSHIPS APPROVED BY THE SECTIONS INDICATED

##### LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY

Krashen, Avery S., Chicago.

#### PHARMACOLOGY AND THERAPEUTICS

Abren, Benedict E., Oklahoma City.  
Anderson, Hamilton H., Peiping, China.  
Grollman, Arthur, Baltimore.  
Larson, Edward, Philadelphia.  
Ligon, Edgar William Jr., Washington, D. C.  
Mudd, Stuart, Haverford, Pa.  
Pfeiffer, Carl, Detroit, Mich.  
Smith, Austin E., Chicago.

#### PATHOLOGY AND PHYSIOLOGY

Huber, John Franklin, Philadelphia.

#### PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH

Gebhard, Bruno, Cleveland.

#### RADIOLOGY

Cahal, Mac F., Chicago.

#### Place of 1944 Annual Session

Dr. Arthur W. Booth, Chairman, Board of Trustees, presented the following report:

Because of largely increased attendance at annual sessions of the Association, it is becoming increasingly difficult to select for a place of meeting any city which will provide altogether adequate and satisfactory facilities for scientific meetings and exhibits and at the same time provide adequate hotel accommodations.

Invitations for the 1944 session of the Association have been received from Atlantic City, New York, Philadelphia and St. Louis (the names are mentioned in alphabetical order).

Atlantic City has adequate hotel facilities and adequate accommodations for exhibits and meeting places in the same building.

New York has altogether adequate hotel facilities, but it does not have a satisfactory building for exhibits and for scientific meetings; all of the latter would have to be held in buildings other than the Auditorium.

Philadelphia has relatively limited hotel capacity, and the auditorium is rather remotely located.

St. Louis has an auditorium which is satisfactory for exhibit purposes but inadequate for section meetings. Several sections would have to be housed elsewhere.

Dr. Robert E. Schlucter, Missouri, presented an invitation from the St. Louis Medical Society and the people of St. Louis to meet in St. Louis in 1944. The nomination was seconded by Drs. James Q. Graves, Louisiana; Burt R. Shurly, Section on Laryngology, Otology and Rhinology, and others.

Dr. Andrew F. McBride, New Jersey, withdrew the invitation for the Association to meet in Atlantic City in 1944 but extended it for 1945.

Dr. Charles Gordon Heyd, Past President, invited the Association to meet in New York City in 1944.

Dr. Walter F. Donaldson, Pennsylvania, invited the Association to meet in Philadelphia in 1944.

The Secretary announced that mayors, governors, members of civic bodies of all kinds and especially members of the medical schools in the various cities that have been nominated for the place of meeting in 1944 have supported the invitations received from the medical societies in the cities extending invitations.

On request of the Speaker, the tellers spread the ballot, and the Secretary announced that 160 delegates had been recorded present and that 134 votes had been cast, of which 17 votes had been cast for New York, 23 for Philadelphia, 93 for St. Louis and 1 for Atlantic City.

The Speaker declared that the House of Delegates had selected St. Louis in which to hold the 1944 annual session of the American Medical Association.

#### UNFINISHED BUSINESS

#### Resolutions from Section on Dermatology and Syphilology Dealing with Medical Preparedness

Dr. Clyde L. Cummer, Section on Dermatology and Syphilology, presented resolutions dealing with medical preparedness, which, as amended, read as follows:

The Section on Dermatology and Syphilology unanimously adopted resolutions, with the recommendation that they be laid before the Committee on Medical Preparedness of the American



Medical Association for appropriate action, the purpose of them being to insure the best medical care for the personnel of the Army and Navy, and also to insure the most effective use of civilian physicians, particularly specialists, who are or may be called to duty with the armed forces. These resolutions as amended by the House read:

*Resolved*, That separate services for the specialties recognized by the American Medical Association and by the national boards for the medical specialties should be organized and maintained in the Medical Corps of the Army and Navy; and

*Resolved*, That in all military and naval hospitals of sufficient size and permanence to warrant special departments, adequate physical facilities, equipment and personnel be made available for the proper practice of each specialty indicated; and

*Resolved*, That the national boards for the various specialties be asked to study the facilities to be made available in military and naval hospitals, with the view of giving credit to junior medical officers for the time spent in these departments.

The Section on Dermatology and Syphilology is further of the opinion that the adoption of these suggestions will be of significant influence in the following directions: 1. It will tend to integrate military and civilian medicine and to reduce the disruption caused by differing divisions of specialization in these two fields. 2. It will prove an effective means of attracting to military service young physicians who wish to qualify as specialists, as they will have opportunities for gaining experience which will be recognized by the American boards of special certification. 3. With particular regard to the specialty of dermatology and syphilology, it will tend to improve the methods of prevention and treatment of skin diseases and syphilis, not only in the large military and naval hospitals but throughout the services.

It is hoped that the resolutions passed by this section will have the support of the other sections of the American Medical Association and that prompt action will be taken on these resolutions by the House of Delegates and by the Committee on Medical Preparedness.

The resolutions as amended were referred to the Committee on Medical Preparedness with power to act with approval of the Board of Trustees after conference with the Surgeon Generals of the Army and Navy, on motion of Dr. Arthur T. McCormack, Kentucky, seconded by Dr. Cummer, and carried after discussion.

#### Expressions of Appreciation

Dr. Arthur T. McCormack, Kentucky, moved that the House of Delegates extend its deep appreciation to the Ohio State Medical Association, including the Academy of Medicine of Cleveland, to the president of the Ohio State Medical Association and the president of the Academy, to Governor Bricker and to Mayor Blythin, and especially to the Chairman of the Local Committee on Arrangements, Dr. Cummer, his associates and the ladies associated with them in the beautiful arrangements they have made, to the press and to the entire citizenship of Cleveland, because of receiving from every one a welcome that will always be remembered. The motion was seconded by Dr. J. Newton Hunsberger, Pennsylvania, and Dr. William Weston, Section on Pediatrics, after which Dr. Arthur J. Bedell, Section on Ophthalmology, moved that the House express that appreciation by a rising vote. The motion was carried unanimously by a rising vote.

The Vice Speaker took the chair, and Dr. Arthur T. McCormack, Kentucky, moved that the gratitude of the House be extended to the Speaker, and that affection, love and confidence be extended to the retiring President, Dr. Nathan B. Van Etten, with the hope that his future contributions to medicine and to human life, his welfare and his happiness will continue for many, many years. The motion was seconded and carried by a rising vote.

The Speaker resumed the chair and stated that a motion to adjourn was in order.

On motion of Dr. William H. Myers, Georgia, duly seconded and carried, the House adjourned sine die at 4:20 p. m.

## THE SCIENTIFIC EXHIBIT

The Scientific Exhibit at the Cleveland session was notable for its attractiveness and for the excellent demonstrations by all who participated. New booth equipment was used throughout, including fluorescent lighting.

There were one hundred and seventy-one exhibits, one hundred and fifty-nine of which were presented under the auspices of the various sections and ten on national defense and war medicine. There were two special exhibits subsidized by the Board of Trustees and one hundred and five motion pictures, which were shown in six areas adjoining the exhibits.

The Special Exhibit on Fractures was presented for the eleventh time under the auspices of a committee composed of Dr. Kellogg Speed, Chicago, chairman; Dr. Frank D. Dickson, Kansas City, Mo., and Dr. Walter Estell Lee, Philadelphia. Dr. Carl H. Lenhart, Cleveland, served as local representative. Nearly fifty physicians assisted with the demonstrations in six booths continuously throughout the week, and a pamphlet describing the exhibit was distributed.

The Special Exhibit on Lame Backs was presented for the second time under the auspices of a committee composed of Dr. Frank R. Ober, Boston, chairman; Dr. Carl E. Badgley, Ann Arbor, Mich.; Dr. J. Archer O'Reilly, St. Louis; Dr. Arthur Steindler, Iowa City, and Dr. Philip D. Wilson, New York, with the collaboration of Dr. Eben J. Carey, Milwaukee; Dr. Albert Ferguson, Brookline, Mass.; Dr. Theodore Willis, Cleveland, and Dr. Walter J. Zeiter, Cleveland. A group of fifty physicians participated throughout the week in the demonstrations, and a pamphlet describing the exhibit was distributed.

The group of exhibits on national defense and war medicine emphasized some of the factors paramount in the present emergency. Three large exhibits on the desiccation of human blood plasma received special certificates of merit. Another exhibit on aviation medicine received a bronze medal. There were six motion pictures dealing with the various phases of national defense and war medicine shown in an area adjoining the exhibits.

The Section on Practice of Medicine presented twenty-six exhibits, including a large group on heart disease and several historical exhibits. Four exhibits received certificates of merit and four received honorable mention. Dr. Louis B. LaPlace, Philadelphia, was the section representative.

The Section on Surgery, General and Abdominal, presented twenty-six exhibits, including a group on the subject of burns and a group on cancer. To this section were awarded a gold medal, a silver medal, a bronze medal, a certificate of merit and an honorable mention. Among the motion pictures dealing with surgery were seventeen on general surgery, fourteen on the surgical aspects of cancer, nine on plastic surgery and eleven on surgical anatomy. The section representative was Dr. Grover C. Penberthy, Detroit.

The Section on Obstetrics and Gynecology presented eleven exhibits, one of which received a certificate of merit. There were five motion pictures. The section representative was Dr. H. Close Hesselstine, Chicago.

The Section on Ophthalmology had seven exhibits, one of which received a certificate of merit and one an honorable mention. There were one motion picture and one lantern slide demonstration on the subject of ophthalmology. The committee from the section consisted of Dr. Georgiana Dvorak Theobald, Oak Park, Ill., chairman; Dr. Derrick Vail, Cincinnati, and Dr. John E. L. Keyes, Youngstown, Ohio.

The Section on Laryngology, Otology and Rhinology presented five exhibits, two of which received honorable mention. There were two motion pictures. The section representative was Dr. Fred W. Dixon, Cleveland.

The Section on Pediatrics had eight exhibits, among which were three on the control of air borne infection which received special mention. The section representative was Dr. Arthur F. Abt, Chicago.

The Section on Pharmacology and Therapeutics presented six exhibits, two of which received honorable mention. The section representative was Dr. O. P. J. Falk, St. Louis.

The Section on Pathology and Physiology had fourteen exhibits. The section representative was Dr. Frank W. Konzelmann, Philadelphia.

The Section on Nervous and Mental Diseases showed six exhibits and six motion pictures. The section representative was Dr. Frederick P. Moersch, Rochester, Minn.

The Section on Dermatology and Syphilology showed seven exhibits, one of which received a silver medal and three of which received certificates of merit. There were six motion pictures and a lantern slide demonstration. The representative was Dr. Hamilton Montgomery, Rochester, Minn.

The Section on Preventive and Industrial Medicine and Public Health presented twelve exhibits, two of which received certificates of merit. Three motion pictures were shown. The representative to the section was Dr. Paul A. Davis, Akron, Ohio.

The Section on Urology presented six exhibits, one of which received a certificate of merit and one honorable mention. There were twelve motion pictures. The section representative was Dr. John H. Morrissey, New York.

The Section on Orthopedic Surgery had six exhibits, one of which received a certificate of merit. There were three motion pictures. The section representative was Dr. Theodore A. Willis, Cleveland.

The Section on Gastro-Enterology and Proctology had six exhibits, one of which received a gold medal. There were two motion pictures. Dr. Sara M. Jordan, Boston, was the section representative.

The Section on Radiology presented five exhibits, one of which received a certificate of merit. The section representative was Dr. S. W. Donaldson, Ann Arbor, Mich.

The Section on Anesthesiology presented eight exhibits, one of which received honorable mention. There was one motion picture. The section representative was Dr. Paul M. Wood, New York.

Thirty-four papers read before the sections of the Scientific Assembly were correlated with the exhibits in the Scientific Exhibit.

Appreciation is expressed to Western Reserve University Medical School for the students who assisted in the demonstrations on fractures and lame backs and in the motion picture theaters.

Acknowledgment is likewise made to the many Cleveland physicians for their numerous courtesies and to the local committee on Scientific Exhibit, of which Dr. Robert M. Stecher was chairman.

## REPORT OF THE COMMITTEE ON AWARDS

The Committee on Awards made the following report:

### GROUP I

*(Awards in Group I are made for exhibits of individual investigation, which are judged on the basis of originality and excellence of presentation.)*

The GOLD MEDAL to Alvin L. Berman, F. S. Grodins and A. C. Ivy, Northwestern University Medical School, Chicago, for exhibit on the rationale of bile salt therapy.

The SILVER MEDAL to Harold Thomas Hyman, William Leifer and Louis Chargin, Mount Sinai Hospital, New York, for exhibit illustrating massive dose chemotherapy of early syphilis by the intravenous drip method.

The BRONZE MEDAL to Walter M. Boothby, W. R. Lovelace, C. W. Mayo and A. H. Bulbulian, Mayo Foundation, Rochester, Minn., for exhibit illustrating physiologic problems in aviation medicine.

CERTIFICATES OF MERIT, Group I, are awarded to the following (alphabetically arranged):

Charles C. Higgins, Cleveland Clinic, Cleveland, for exhibit illustrating renal lithiasis, an experimental and clinical study.

Walter A. Hoyt, Adrian E. Davis and George Van Buren, Akron Children's Hospital, Akron, Ohio, for exhibit on the treatment of acute osteomyelitis by sulfathiazole without operation.

Charles Huggins, George Gomori, C. V. Hodges and W. W. Scott, University of Chicago, Chicago, for exhibit illustrating phosphatases and carcinoma of the prostate gland.

Benjamin S. Kline, Mount Sinai Hospital, Cleveland, for exhibit illustrating new standard antigen (water purified) for the microscopic slide precipitation tests for syphilis.

Phillips Thygeson and W. L. Stone Jr., Institute of Ophthalmology, New York, for exhibit on the epidemiology of inclusion conjunctivitis.

Leandro M. Tocantins, J. F. O'Neill and H. W. Jones, Jefferson Medical College of Philadelphia, Philadelphia, for exhibit on infusions of blood and other fluids into the circulation via the bone marrow.

In addition, the following exhibits are deemed worthy of Honorable Mention (alphabetically arranged):

That of F. Lowell Dunn, University of Nebraska College of Medicine, Omaha, and Walter J. Rahm Jr., New York, on the cathode ray visualization of normal and pathologic chest sounds.

That of Chevalier L. Jackson and John Franklin Huber, Temple University School of Medicine, Philadelphia, on applied anatomy of the tracheobronchial tree.

That of Louis N. Katz, Raymond S. Megibow, Franz S. Steinitz, Milton Mendlowitz and Maurice Sokolow, Michael

Reese Hospital, Chicago, illustrating observations on pulmonary embolism.

That of H. G. Kobrak, J. R. Lindsay and H. B. Perlman, University of Chicago, Chicago, on the conduction of sound in the ear.

That of E. Perry McCullagh, E. J. Ryan and D. Roy McCullagh, Cleveland Clinic, Cleveland, on male sex hormones—some physiologic and clinical observations.

That of Thomas H. Seldon and John S. Lundy, Institute of Experimental Medicine, Mayo Foundation and Section on Anesthesia, Mayo Clinic, Rochester, Minn., on effect of certain general anesthetic agents on the small vessels of the rabbit's ear.

### GROUP II

*(Awards in Group II are made for exhibits which do not exemplify purely experimental studies and which are judged on the basis of excellence of presentation and correlation of facts.)*

The GOLD MEDAL to Waltman Walters, Howard K. Gray and James T. Priestley, Mayo Clinic, Rochester, Minn., for exhibit illustrating malignant lesions of the stomach; importance of early treatment and results.

The SILVER MEDAL to Grover C. Penberthy and Charles N. Weller, Children's Hospital of Michigan, Wayne University College of Medicine, Detroit, for exhibit illustrating the treatment of burns.

The BRONZE MEDAL to G. V. Brindley, Scott and White Hospital, Temple, Texas, for exhibit illustrating carcinoma of the colon; factors affecting its cure.

CERTIFICATES OF MERIT, Group II, are awarded to the following (alphabetically arranged):

David C. Elliott, Chicago; George Baehr, New York; Loren Shaffer, Detroit; Glenn S. Usher and S. Allan Lough, Washington, D. C., U. S. Public Health Service, for exhibit on syphilis—massive dose therapy.

Henry N. Harkins, Henry Ford Hospital, Detroit, exhibit illustrating the treatment of burn shock.

Robert A. Kchoe, University of Cincinnati College of Medicine, Cincinnati, for exhibit on lead poisoning.

John T. Murphy and C. E. Hufford, Toledo, Ohio, for exhibit on bone tumors.

I. C. Rubin, Mount Sinai Hospital, New York, for exhibit illustrating diagnosis of impaired tubal function by kymographic uterotubal insufflation and soluble viscous contrast medium.

E. R. Sayers and H. H. Schrenk, United States Bureau of Mines, Washington, D. C., for exhibit on respiratory protective equipment in mining and industrial work.

In addition, the following exhibits are deemed worthy of Honorable Mention (alphabetically arranged):

That of K. K. Chen and G. H. A. Clowes, the Lilly Research Laboratories, Indianapolis, on variations of drug action.

That of Alfred E. Cohn, Hospital of the Rockefeller Institute for Medical Research, New York, on some aspects of the natural history of rheumatic heart disease.

That of Robert M. Daley, Richard Gubner and Harry E. Ungereider, Equitable Life Assurance Society, New York, on the clinical evaluation of heart size measurements.

That of W. D. Gatch and J. S. Battersby, Indiana University Medical Center, Indianapolis, on effect of bowel distention on plasma volume.

That of W. Ray Jones, King County Hospital System, Seattle, on microslide diagnosis of atypical gonorrhea.

That of Albert D. Ruedemann, Cleveland Clinic, Cleveland, on exophthalmos.

#### SPECIAL CERTIFICATES OF MERIT

Special Certificates of Merit are awarded to the following historical exhibits (alphabetically arranged):

Paul E. Bechet, New York Post-Graduate Medical School and Hospital, New York, for exhibit on early American dermatologists.

Howard Dittrick, Cleveland Medical Library, Cleveland, for exhibit showing objects relating to blood letting, cupping transfusion, blood pressure and blood examination.

Russell L. Haden and Joseph Lucas, Cleveland Clinic, Cleveland, for exhibit on origin and early history of the microscope.

Nolie Mumey, Denver, for exhibit on primitive medicine.

Special Certificates of Merit are awarded to the following for the development of a method for the desiccation of human blood plasma (alphabetically arranged):

Samuel B. Harper and A. E. Osterberg, Mayo Clinic, Rochester, Minn.

Frank W. Hartman, Henry Ford Hospital, Detroit.

Joseph M. Hill, E. E. Muirhead, C. E. Ashworth and Louis Waters, Baylor University Hospital, Dallas, Texas.

#### SPECIAL COMMENDATION

Special commendation is given to the exhibits on the control of air borne infection.

#### SUBSIDIZED EXHIBITS

The Committee on Awards commends highly the special exhibits on fractures and lame backs sponsored by the Ameri-

can Medical Association, and the exhibit on nutritionally improved flour presented by members of the Council on Foods and Nutrition of the American Medical Association.

#### COMMENTS AND RECOMMENDATIONS

The innovation of providing six small theaters for the projection of silent and sound motion pictures introduces a feature of the Scientific Exhibit which will undoubtedly grow in interest and in importance. The transfer of motion pictures from the exhibit booths to the theaters has many obvious advantages. It is now quite apparent that motion pictures, particularly those in natural color, provide a teaching medium of increasing importance. It is the recommendation of the Committee on Awards that adequate space and facilities be provided at the forthcoming Atlantic City meeting for continuation and possible extension of this new feature of the Scientific Exhibit.

The Committee commends highly the plan of coordinating, as far as possible, the exhibits with papers read by exhibitors before the section meetings. The representatives to the Scientific Exhibit from the sixteen sections have rendered yeoman service to the Committee on Scientific Exhibit and to the Director of the Scientific Exhibit in encouraging the presentation of exhibit material of exceptional merit. Because of the general excellence of the exhibits, only the limitation of the number of awards available prevented official recognition of many exhibits of undoubted merit.

The Committee on Awards recommends to the Board of Trustees that certain of the exhibits which are of a character which would permit their utilization as traveling exhibits for loan to state or sectional medical societies be acquired for that purpose.

The Committee is deeply impressed with the spirit of cooperation existing between the Committee on Scientific Exhibit of the Board of Trustees, the Advisory Committee to the Scientific Exhibit, the section representatives and the Director of the Scientific Exhibit. This report would fail in its mission if it did not give particular recognition to the ability and tactfulness of Dr. Thomas G. Hull, Director of the Scientific Exhibit, in making the Scientific Exhibit the outstanding feature of the annual session of the American Medical Association.

WALTER M. SIMPSON, Dayton, Ohio, Chairman.

HAROLD S. DIEHL, Minneapolis.

HARRY S. GRADLE, Chicago.

WILLIAM P. HERBST, Washington, D. C.

MAX M. PEET, Ann Arbor, Mich.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status.*—H. R. 3864 has been reported to the House, proposing to amend an act to provide for the registry of pursers and surgeons as staff officers on vessels of the United States. Under existing law, senior registered surgeons and other surgeons, if any, and their assistants or aides are placed under the charge of the senior registered purser. The pending bill proposes to set up a separate medical division of the staff department, to be under the charge of the senior registered surgeon of the vessel, who will be responsible solely to the master of the vessel. S. 1524 has passed the Senate, authorizing the President to provide for the deferment from training and service under the Selective Training and Service Act of men who are 28 years old or over. H. R. 4545 has passed the House and Senate, providing for the acquisition and equipment of public works made necessary by the defense program, including the acquisition and equipment of hospitals.

*Bills Introduced.*—H. R. 5045, introduced by Representative Mott, Oregon, proposes to authorize pensions to all persons who served ninety days in foreign service under the jurisdiction of the Quartermaster General, Surgeon General of the United States Army, the Secretary of the Navy, or Marine Corps, during the Spanish-American War, including the Philippine Insurrection and the Chinese Boxer Rebellion. H. R. 4882, introduced by Representative Healey, Massachusetts, proposes,

among other things, to extend the coverage of the Social Security Act with respect to old age and survivors' insurance benefits to employees of corporations, community chests, funds or foundations organized and operated exclusively for charitable, religious, scientific, literary or educational purposes, for the prevention of cruelty to children or animals and for religious purposes, excluding duly ordained or commissioned or licensed ministers of any church in the regular exercise of their ministry and excluding services performed by regular members of religious orders in the exercise of duties required by such orders.

### STATE MEDICAL LEGISLATION

#### Texas

*Bill Enacted.*—H. 620 was approved by the governor, June 10, authorizing the board of regents of the University of Texas to maintain a hospital and to collect a compulsory group hospitalization fee of not to exceed \$4 for any one semester or for any one summer session from each student as a prerequisite to registration in the university.

#### Pennsylvania

*Bill Introduced.*—S. 1172 proposes to appropriate \$100,000 to the department of health to equip and operate a sanatorium in Butler County for the treatment of cancer and for cancer research.

## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### ARKANSAS

**Annual Registration Due July 1.**—All licentiates of the State Medical Board of the Arkansas Medical Society are required by law to register this year with the board on or before July 1 and at that time to pay the required fee, which is \$2 for residents and \$4 for nonresidents. After this year the required date for registration will be January 1 and the fee required will be such fee as may be set by the board not less than sixty days in advance of January 1. If a licentiate fails to pay the required annual fee before March 1 of any year, his license to practice automatically expires but may be reinstated on the payment of all delinquent fees and a penalty of \$1 for each year, or part thereof, of delinquency.

### IDAHO

**Annual Registration Due July 1.**—All practitioners of medicine and surgery holding licenses to practice in Idaho are required by law to register annually on July 1 with the Department of Law Enforcement and at that time to pay a fee of \$2. If a licentiate has not paid the annual registration fee by October 1, his license can be canceled but will be restored within five years thereafter on payment of the delinquent fees and a \$10 penalty. If a license has been canceled for more than five years, it can be reinstated only on the payment of \$25 and on the licentiate's passing an examination, the nature of which shall be determined by the Department of Law Enforcement.

### ILLINOIS

**Personal.**—Dr. Roger W. DeBusk, assistant director of St. Luke's Hospital, New York, has been appointed superintendent of Evanston Hospital, succeeding Miss Ada Belle McCleery, who retired May 1 after holding the position since 1921. Dr. Cecil A. Z. Sharp has resigned as superintendent of the Macomb health district to enter private practice in Trenton.

**Fifty Years of Medicine.**—Dr. William O. Tuck, Plymouth, recently completed fifty years in the practice of medicine. Dr. Thomas J. Hilliard, Fairfield, observed his fiftieth anniversary as a physician on April 20. He has been practicing in Fairfield since 1906. Dr. and Mrs. Edward A. Elfeld, Arlington Heights, were guests of honor at a dinner, recently, marking the physician's completion of fifty years in the practice of medicine, thirty-nine of which were spent in Arlington Heights.

### Chicago

**Society News.**—The Chicago Gynecological Society was addressed, April 18, by Drs. Edward A. Schumann, Philadelphia, on "An Evaluation of the Several Types of Cesarean Section and Their Indications" and Walter W. Coen, "Indications for the Schumann Type of Cesarean Section." The Chicago Orthopedic Society was addressed, May 9, by Drs. John Albert Key, St. Louis, on "Use of Sulfanilamide and Sulfathiazole in Clean and Infected Operative Wounds" and Cly Howard Hatcher, "Solitary Eosinophilic Granuloma of Bone." At the annual meeting of the Chicago Pathological Society on May 12 Drs. Karl A. Meyer and Alex B. Ragins discussed "Carcinoma of the Parathyroid."

**Dr. Geiling Receives Mendel Medal.**—Dr. Eugene M. K. Geiling, since 1936 professor and chairman of the department of pharmacology, University of Chicago, The School of Medicine, was presented with the Mendel Medal by Villanova College, Villanova, Pa., "for his contributions to the knowledge of the pituitary gland, its relation to other glands and for his assistance in the crystallization of insulin." The medal is "given annually for outstanding achievement in science." Dr. Geiling was born in Orange Free State, South Africa, in 1891 and graduated at Johns Hopkins University School of Medicine, Baltimore, in 1923. He has served on the faculties of the College of Agriculture, South Africa, 1917-1918; College of Medicine, University of Capetown, 1918-1919; Johns Hopkins, 1921-1935, and, in 1936, joined the University of Chicago. He is president of the American Society for Pharmacology and Experimental Therapeutics.

### IOWA

**State Medical Election—Coordinator Named for President.**—Dr. Frank P. Winkler, Sibley, was chosen president-elect of the Iowa State Medical Society at its annual meeting in Davenport, May 16, and Dr. Earl B. Bush, Ames, was installed as president. Dr. Joseph B. Priestley, Des Moines, was named general coordinator to have charge of such functions as the new president will be unable to manage because of his army duties. Dr. Bush is a colonel in the National Guard on active duty with the army as chief surgeon at Camp Claiborne, La. Other officers elected include Drs. James C. Hill, Newton, and George C. Albright, Iowa City, vice presidents.

**District Medical Meeting.**—The Iowa and Illinois Central District Medical Association will hold its annual meeting at the Outing Club in Davenport, June 26. The speakers will include:

Dr. John A. Toomey, Cleveland, Pathogenesis of Poliomyelitis.  
Dr. Howard K. Gray, Rochester, Minn., Cancer of the Stomach.  
Dr. Otto H. Schwarz, St. Louis, Hyperplasia of the Endometrium.

At the banquet in the evening, medals will be presented to Drs. Edward F. Strohbehn, Davenport, and Thomas F. Beveridge, Muscatine, who have completed fifty years of practice. Dr. Morris Fishbein, Editor of THE JOURNAL, Chicago, will speak on "American Medicine Prepares."

### KENTUCKY

**Dr. Rankin Appointed to University Staff.**—Dr. Fred W. Rankin, Lexington, President-Elect of the American Medical Association, has been appointed clinical professor of surgery at the University of Louisville School of Medicine, effective July 1.

### LOUISIANA

**Society News.**—A joint meeting of the Orleans Parish Medical Society with the New Orleans Gynecological and Obstetrical Society, May 16, was designated the "Dr. Ernest S. Lewis Memorial Meeting." The speakers were Drs. Hiram W. Kostmayer, New Orleans, on "The Life of Dr. Maurice J. Gelpi" and Jacob P. Greenhill, Chicago, "The Practical Aspects of Gynecologic Endocrinology."

**Personal.**—Dr. Robert S. Teague Jr., instructor in pharmacology, Tulane University of Louisiana School of Medicine, New Orleans, recently was awarded the Lewis Cass Ledyard Jr. Fellowship for medical research, according to an announcement from the joint administrative board of the New York Hospital and Cornell University Medical College, New York. The award, providing \$4,000, is made annually to a young physician or surgeon demonstrating fitness to carry on original research of high order. Dr. Teague will engage in research on chemical substitutes for female sex hormones, newspapers reported. Dr. Teague graduated at the Department of Medicine, University of Chicago, in 1937. Dr. William W. Leake, New Orleans, formerly superintendent of Charity Hospital, was appointed chief surgeon of the Illinois Central System, with offices in Chicago, effective May 1. He succeeds Dr. Guy G. Dowdall, Chicago, who retired on account of his health.

### MASSACHUSETTS

**State Medical Election.**—Dr. George L. Schadt, Springfield, was chosen president-elect of the Massachusetts Medical Society at its annual meeting recently and Dr. Frank R. Ober, Boston, was inducted as president. Other officers are Drs. Edward P. Bagg, Holyoke, vice president; Michael A. Tighe, Lowell, secretary, and Charles S. Butler, Boston, treasurer.

**Dr. Gordon Injured in England.**—Dr. John E. Gordon, professor of preventive medicine and epidemiology, Harvard Medical School, Boston, who is now acting as liaison officer between the British Ministry of Health and the United States and director of the American Red Cross-Harvard University Hospital Unit in England, and the chief physician of the unit, Dr. Paul B. Beeson, resident physician of the Peter Bent Brigham Hospital and assistant in medicine, Harvard Medical School, Boston, were injured in a raid when Dr. Gordon's apartment was bombed. Dr. Gordon, writing to the British Ministry of Health, said: "Within a few minutes (after the explosion) one of your first aid workers, a young lady, popped in off the street, put a towel over my bleeding head, and with my colleague Dr. Beeson proceeded with us to the nearest first aid post. She deposited us with the nurse in charge there, said

a curt good night, and I have not seen her since. She just went about her business. At the first aid post we had the finest attention from four or five nurses and first aid workers. A young doctor arrived promptly and made a few minor repairs that were indicated. We were then put to bed at the first aid post between warm blankets, packed with hot water bottles and given a steaming cup of hot tea and a cigaret and within fifteen minutes were as comfortable as could be."

### MICHIGAN

**Hickey Memorial Lecture.**—Dr. John T. Murphy, Toledo, Ohio, delivered the 1941 Hickey Memorial Lecture before the Wayne County Medical Society and the Detroit Roentgen Ray and Radium Society, Detroit, April 7. His subject was "The Use of X-Ray in the Treatment of Carcinoma of the Skin."

**Annual Concert of Glee Club.**—The seventh annual concert of the Glee Club of the Wayne County Medical Society was held at the Detroit Institute of Art, April 28. Marcus Kellerman, an honorary member of the society, is director of the Glee Club. Soloists were Drs. Starr L. Kline, tenor, and Leo P. Rennell, baritone, with piano selections by Drs. Reginald Stanley Brain and Henry S. Brown.

**Nutrition Defense Committee.**—Marie Dye, Ph.D., dean of the division of home economics and professor of foods and nutrition, Michigan State College, East Lansing, has been chosen chairman of the newly formed Michigan Nutrition Defense Committee. Membership in the committee, which held its first meeting April 30, has been drawn from twenty-two public agencies and private organizations, according to *Michigan Public Health*. Similar committees are being established in other states.

**Personal.**—Dr. Robert L. Novy, professor of clinical medicine, Wayne University College of Medicine, Detroit, has been made a member of the city board of health. He succeeds Dr. Clarence L. Candler, who has completed the unexpired term of the late Dr. William A. Evans.—John A. Galbo, D.D.S., Detroit, has been appointed a member of the Michigan State Council of Health.—Dr. Harry W. Plaggemeyer, Detroit, was recently made an honorary member of the Wisconsin Urological Society.—Dr. Plinn F. Morse, Detroit, was honored at a banquet, May 7, and presented with a gold watch from members of the staff of Harper Hospital. Dr. Eldwin R. Witwer was toastmaster, and speakers included Drs. George A. Kamperman and Lawrence Reynolds. All are from Detroit.

### MONTANA

**Society News.**—Dr. Fred H. Albee, New York, was the principal speaker before the Montana Surgical Guild at its clinical meeting in Great Falls April 25.—Dr. E. Martin Larson, Great Falls, was reelected president of the Montana Tuberculosis Association at its meeting in Helena April 19; he has been president since 1934.—Dr. Marjorie K. Smith, St. Albans, N. Y., has been named assistant director of the maternal and child health division of the Montana State Board of Health.

### NEBRASKA

**Postgraduate Courses in Obstetrics and Pediatrics.**—The University of Nebraska College of Medicine, Omaha, in cooperation with the maternal and child health committee of the Nebraska State Medical Association and the maternal and child health division of the Nebraska State Department of Health presented an extramural postgraduate course in obstetrics and pediatrics in five towns between June 9 and 20, two sessions in each town, one week apart. The instructors were Drs. Willis E. Brown, assistant professor of obstetrics and gynecology, and John L. Gedgoud, assistant professor of pediatrics at the university medical school. The towns visited were Grand Island, Hastings, Kearney, York and Beatrice. In addition, a statewide conference on care of premature infants is being presented with sessions at Norfolk, Alliance, North Platte, McCook, Grand Island, Hastings, Columbus and Beatrice, June 12 through 28. The lecturers are Dr. Albert V. Stoesser, associate professor of pediatrics, University of Minnesota Medical School, Minneapolis, and Miss Gertrude E. Carlsrud, R.N., of the division of child hygiene, Minnesota Department of Health, Minneapolis. This course is presented by the state medical association, the state health department, the Nebraska State Nurses Association and the Nebraska League of Nursing Education.

### NEW YORK

**Rochester Academy Awards.**—The Rochester Academy of Medicine awarded its Albert D. Kaiser Medal "for distinguished service to the medical profession" to Dr. David B. Jewett at its annual meeting, May 6. Dr. Jewett was honored for his efforts in building up the academy's library. Scientific awards of \$100 and certificates were presented to Dr. Leonard K. Stalker for research on peptic ulcer and to Dr. William W. Stiles for research on leptospirosis.

**Society News.**—Dr. Robert S. Goodhart, Forest Hills, addressed the Tompkins County Medical Society, Ithaca, April 15, on "The Relations of Vitamins to Disease."—Dr. James M. Flynn, Rochester, then president of the Medical Society of the State of New York, addressed a joint meeting of the Warren, Washington and Saratoga county medical societies in Glens Falls, April 14, on "Organization in the Practice of Medicine."—Capt. Edwin N. Beery, M. R. C., U. S. Army, Governors Island, addressed the Utica Academy of Medicine and the Utica Dental Society at a joint meeting in Utica, April 17, on "The Medical Profession in a National Emergency."

### New York City

**Spring Festival.**—The Medical Society of the County of Kings held its second spring festival, May 12-17. Tournaments in tennis and bowling were held during the week, there was a hobby show at the New Swedish Hospital and on Saturday May 17 the Doctors' Musical Society of Brooklyn gave its fifth annual concert at the Brooklyn Academy of Medicine.

**Hospital News.**—The cornerstone for a nine story addition to St. Vincent's Hospital was laid recently. The new building is part of a \$1,300,000 project which will bring the capacity of the hospital to 600. It will include also equipment, alterations and transfer of departments. Former Gov. Alfred E. Smith presided at the ceremony and Archbishop Francis J. Spellman laid the stone.—The cornerstone of a new building for Lebanon Hospital was laid April 20 by L. Victor Weil, president of the hospital. It is expected that the new structure, which will have a capacity of 400 beds, will be finished early next year.—A fellowship in ophthalmologic research has been established at Montefiore Hospital in memory of Ernestine Lambert Cohn. Dr. Virginia L. Lubkin, a member of the house staff, is the first holder of the fellowship.

**Personal.**—Dr. Ralph Irving Lloyd, Brooklyn, was the guest of honor at the annual dinner of the Brooklyn Ophthalmological Society, May 21. Dr. Lloyd, a past president of the Brooklyn society, is president-elect of the American Academy of Ophthalmology and Otolaryngology. Dr. Joseph E. Golding was toastmaster and speakers included Drs. Maurice L. Wieselthier, Maurice J. Dattelbaum, Percy Fridenberg and Algernon B. Reese. The society gave Dr. Lloyd a portable radio. About seventy-five eye physicians attended the dinner.—Dr. Charles Perley Gray was guest of honor at a dinner, May 19, given by the Seventh Regiment Veterans Association on the occasion of his retirement as colonel in the New York National Guard.—Dr. Edmund P. Fowler has been elected president of the New York League for the Hard of Hearing.

**Typhoid Outbreak on Spanish Ship.**—Three positive cases and three suspected cases of typhoid in New York, one at Ellis Island and two in Boston have been reported among passengers who debarked from the Spanish steamship *Magallanes* on May 24, the New York City Department of Health reported on June 3. The outbreak was discovered when Mount Sinai Hospital reported on May 28 that one passenger from the ship had arrived there with the disease. This patient later died. Investigation of the one hundred and sixty-one other passengers disclosed the other cases. The ship, which originally sailed from Bilbao, Spain, with three hundred and twenty-six passengers and a crew of one hundred and ninety-six, left New York on its return trip May 27, before the typhoid was discovered, and at the time of the report on June 2 nothing had been heard of it.

### OKLAHOMA

**Society News.**—Dr. Albert R. Hatcher, Wellington, Kan., addressed the Garfield County Medical Society, Enid, April 24, on "Malignancies of the Breast."—Dr. Arthur Graham Ashler, Kansas City, Mo., addressed the Tulsa County Medical Society, Tulsa, May 26, on "Chemical, Nutritional and Clinical Factors Influencing the Administration of Digitalis."—Drs. John H. Lamb, Oklahoma City, and Horton E. Hughes, Shawnee, addressed the Pottawatomie County Medical Society in Shawnee, May 17, on "Photography in Medicine."



## PENNSYLVANIA

**District Meetings.**—The Eighth Councilor District of the Medical Society of the State of Pennsylvania held its annual meeting, June 19, on board the S. S. *South American*, sailing from Erie. The speakers included Lieut. Col. Edgar S. Everhart, medical officer in the National Guard on duty with the U. S. Army, state medical director of selective service, on "The Doctor and the Selective Service"; Dr. Daniel L. Borden, Washington, D. C., "The American Medical Association on Trial," and Francis F. Borzell, Philadelphia, president of the state medical society. The Woman's Auxiliary held its annual meeting at the same time.—The Third and Twelfth councilor districts held a joint meeting at Scranton, June 17. Speakers on the scientific program were Drs. Herbert B. Gibby, Wilkes-Barre, on "Use of Lyophilized Plasma in Peritonitis"; Harrison F. Flippin, Philadelphia, "Use and Abuse of Sulfonamides in General Practice," and Frank W. Konzelmann, Philadelphia, "The Laboratory Situation in Pennsylvania." After luncheon Drs. Francis F. Borzell, Philadelphia, president, and Lewis T. Buckman, Wilkes-Barre, president-elect of the state society, made addresses. The woman's auxiliaries of the two districts also held a joint meeting.

## Philadelphia

**New Officials of Woman's College.**—Dr. Ellen C. Potter, director of medicine in the department of institutions and agencies of the state of New Jersey, has been made acting president of the Woman's Medical College of Pennsylvania to succeed Dr. Chevalier Jackson, who resigned after serving since 1935. At the same time Dr. Margaret D. Craighill, who has been acting dean since Sept. 15, 1940, was appointed dean. Dr. Potter graduated from the Woman's Medical College in 1903 and was a member of the faculty for many years in the department of gynecology. In 1920 she was appointed chief of the child health division of the state health department of Pennsylvania; in 1922, director of child welfare. From 1923 to 1927 she was state secretary of welfare, going to New Jersey in the latter year.

## WASHINGTON

**Annual Registration Due July 1.**—All practitioners of medicine and surgery holding licenses to practice in Washington are required by law to register annually on or before July 1, with the director of licenses, and at that time to pay a fee of \$5, thereby renewing their licenses for one year. Failure on the part of a licensee timely to register and pay the required fee renders his license to practice invalid but his license may be reinstated on written application to the director and on payment of the delinquent fees and a penalty of \$10.

**Society News.**—Dr. Joseph Irving Tuell, Seattle, addressed the King County Medical Society, Seattle, May 9, on "Fractures of the Humerus Involving the Elbow Joint" and Drs. Kenneth K. Sherwood, Seattle, John W. Skinner, Kirkland, and Anette Bocker, A.B., on "Urinary Excretions of Thiamine in Clinical Cases."—Dr. James F. Blackman, Seattle, addressed the Pierce County Medical Society, Tacoma, May 13 on "Management of Crushing Injuries to the Thorax."—The Tacoma Surgical Club held its annual meeting May 3 with Dr. Harry E. Mock, Chicago, as the guest speaker. Traumatic surgery was the topic of the day.

## WEST VIRGINIA

**State Medical Election.**—Dr. Richard O. Rogers, Bluefield, was named president-elect of the West Virginia State Medical Association at the annual meeting in Charleston, May 12-14. He will take office on Jan. 1, 1942. Vice presidents elected were Drs. Guy H. Michael, Belington, and Everett H. Starcher, Earlring. The president for this year is Dr. Robert King Buford, Charleston. The 1942 meeting will be held in White Sulphur Springs.

**Changes in State Health Department.**—Dr. Starling D. Steiner, Wellsburg, health officer of Brooke County, has been appointed director of county health work in the state health department to succeed Dr. Bruce H. Pollock, Charleston, who recently reported for duty with the U. S. Navy. Dr. Leon A. S. Saler, Charleston, U. S. Public Health Service, has been named acting director of the bureau of venereal diseases to replace Dr. Leon A. Dickerson, Fayetteville, who is in active service in the U. S. Army.

## GENERAL

**Meeting of Science Writers.**—John J. O'Neill, science editor, New York *Herald Tribune*, was elected president of the National Association of Science Writers at a meeting held in conjunction with the meeting of the National Academy of Sciences in Washington, D. C., recently. Stephen J. McDonough, science writer of the Associated Press, Washington, was reelected treasurer and made secretary under a newly adopted constitution. Dr. Thomas Parran, surgeon general, U. S. Public Health Service, gave an "off the record" talk on his observations of living conditions, health and the morale of the British people during his recent visit to England.

**National Defense and Home Economics.**—The annual convention of the American Home Economics Association will be held in Chicago, June 22-26, at the Stevens Hotel. The program includes addresses by Helen S. Mitchell, Ph.D., of the Federal Security Agency, Washington, D. C., on "The National Nutrition Outlook"; Mary I. Barber, M.S., food consultant, Office of Production Management, Washington, "How the American Army Is Fed"; Harriet Elliott, M.A., head of the Consumer Division, Office of Price Administration and Civilian Supply, Washington, on "Protecting Civilian Supply"; Ruby Thompson of the Federal Security Agency, Athens, Ga., "Better Diets Through Increased Home Food Production," and Hazel K. Stiebeling, Ph.D., U. S. Bureau of Home Economics, Washington, "Do We Want Better Nutrition?"

**Guggenheim Fellowships.**—Among eighty-five fellowships granted by the John Simon Guggenheim Memorial Foundation for research to be carried on in 1941-1942 were the following of medical interest:

Cornelius Becker, Philip, Ph.D., medical entomologist in the U. S. Public Health Service, Hamilton, Mont., will write a book on ticks and their relation to animal and human disease. He will work in Mexico, Colombia and Brazil.

Kenneth Stewart Cole, Ph.D., associate professor of physiology at Columbia University, New York, and consultant physicist, Presbyterian Hospital, will study the electrical aspects of the structure and function of living nerve.

Berry Campbell, Ph.D., assistant professor of anatomy, University of Oklahoma School of Medicine, Oklahoma City, will study integrative mechanisms of the spinal cord with particular reference to the basic locomotor behavior patterns. He will work at the Rockefeller Institute for Medical Research, New York.

Dr. Israel Lyon Chaikoff, associate professor of physiology, University of California, Berkeley, will investigate the use of radioactive phosphorus and iodine as indicators of metabolic processes.

**Physical Therapy Meeting.**—The ninth annual seminar of the Western Section of the American Congress of Physical Therapy will be held in Los Angeles on June 22. Sessions will be held in Taulson Hall, White Memorial Hospital. The following will participate:

Dr. Clarence W. Dail, Loma Linda, Calif., Physical Measures in the Treatment of Peripheral Vascular Diseases.

Dr. Joseph C. Risser, Pasadena, Differential Diagnosis and Treatment of Lumbosacral and Sacroiliac Pathology.

Dr. Harry C. L. Lindsay, Pasadena, Physical Medicine in Dermatology.

Dr. David H. Kling, Los Angeles, Place of Physical Therapy in the Treatment of Arthritis.

Dr. William H. Northway, San Francisco, Clinical Value of Ultraviolet Light Therapy.

Drs. Fred B. Moor, Los Angeles, and Genevieve L. Joy, Melrose, Mass., Artificial Fever in Brucellosis.

Dr. Frances Baker, San Francisco, Treatment of Fungous Infections by Iontophoresis.

Dr. John S. Hibben, Pasadena, Clinical Evaluation of Various Heart Energies.

Dr. Rodney F. Atsatt, Santa Barbara, Calif., General Physical Therapy Management of Poliomyelitis.

Dr. Mary Cornell McReynolds, Angwin, Calif., Degenerative Changes in Periarticular Tissues.

**National Science Fund Election.**—William J. Robbins, Ph.D., director of the New York Botanical Gardens, New York, was elected chairman of the board of directors of the National Science Fund at an organization meeting, May 21, in New York, and Winthrop W. Aldrich, chairman of the board of directors of the Chase National Bank, New York, was elected vice chairman. The directors include former President Herbert Hoover; Albert F. Blakeslee, Ph.D., Cold Spring Harbor, N. Y.; Luther P. Eisenhart, LL.D., Princeton, N. J.; Dr. Herbert S. Gasser, Mr. Walter S. Gifford, Carleton J. H. Hays, Ph.D., and Frank B. Jewett, Ph.D., New York; Dr. Alfred N. Richards, Philadelphia; Dr. Ross G. Harrison, New Haven, Conn.; Harlow Shapley, Ph.D., Cambridge, Mass.; Mr. Tom K. Smith, St. Louis banker, and Dr. Robbins. The National Science Fund was created recently under the sponsorship of the National Academy of Sciences to receive and administer gifts for the support of fundamental scientific research. It will offer "altruistic people a permanent machinery for wise and fruitful investment in science," it was stated.

# MEDICAL NEWS

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**Special Society Elections.**—Dr. James E. Paullin, Atlanta, Ga., was named president-elect of the American College of Physicians at the recent annual meeting in Boston, and Dr. Roger I. Lee, Boston, was installed as president. Vice presidents elected were Drs. David Slater Lewis, Montreal, Que.; Thomas T. Holt, Wichita, Kan., and Samuel E. Munson, Springfield, Ill. The next annual session will be in St. Paul and the tentative dates are April 20-24, 1942.—Dr. John Jay Keegan, Omaha, was elected president of the Society of Neurological Surgeons at its annual meeting in Richmond, Va., May 1-3; Dr. Wilder G. Penfield, Montreal, Que., vice president, and Dr. Winchell McK. Craig, Rochester, Minn., secretary. The 1942 meeting will be in Boston.—Dr. Harry Goldblatt, Cleveland, was chosen president-elect of the American Society of Clinical Pathologists and Dr. John L. Lattimore, Teneka, Kan., was installed as president at the annual meeting in Cleveland, May 29 to June 2. Dr. Russell L. Haden, Cleveland, was elected vice president and Dr. Alfred S. Giordano, South Bend, Ind., reelected secretary. The Ward Burdick Medal was given to Drs. Harry P. Smith, Emory D. Warner and Kenneth M. Brinkhous, Iowa City, for their studies of vitamin K.—Dr. J. Winthrop Peabody, Washington, D. C., was named president-elect of the American College of Chest Physicians at the annual meeting in Cleveland, May 31-June 2, and Dr. Benjamin Goldberg, Chicago, became president. Other officers elected were Drs. Jay Arthur Myers, Minneapolis, and Grover C. Bellinger, Salem, Ore., vice presidents, and Paul H. Holnipeg, Chicago, secretary.—Dr. Frederick W. Jackson, Winnipeg, Man., was elected president of the Conference of State and Provincial Health Authorities of North America at the annual meeting in Washington, D. C., recently. Dr. Carl V. Reynolds, Raleigh, N. C., was elected vice president and Dr. Albert J. Chesley, St. Paul, was reelected secretary.

**Dr. Love Wins Golf Championship.**—Dr. George R. Love of Oconomowoc, Wis., won the championship of the American Medical Golfing Association June 2 at the Cleveland Country Club and the Pepper Pike Club, Cleveland, in a record breaking field of two hundred and forty-three medical golfers. Dr. Love achieved a gross score of 149 for thirty-six holes by shooting three under par on the last nine holes of the difficult Pepper Pike course. He was presented with the Will Walter Trophy by Dr. David H. Houston, Seattle, president of the A. M. G. A. In addition to the trophy a sterling silver bowl was presented to Dr. Love as a permanent prize.

**Dr. N. E. Baxter of Bloomington, Ind., won the thirty-six hole handicap championship, winning a leg on the Detroit Trophy and receiving a set of Kroydon irons.**

**Dr. James J. Marek of Cleveland was runner up champion with a score of 152. He bagged the famous St. Louis Trophy.**

**Other winners in the thirty-six hole gross event were Dr. John M. Murphy, Detroit, and Dr. R. J. Smith, Buffalo.**

**Dr. J. J. Harrison, Napoleon, Ohio, won the President's Trophy for best net in the championship flight. Other winners were Drs. E. S. Edgerton, Wichita, Kan., and G. T. McKean, Detroit.**

**Dr. D. A. Williams, Kansas City, won the eighteen hole championship, gaining the Golden State Trophy. The runner up was Dr. L. J. Carson of Cleveland.**

**The eighteen hole handicap championship went to Dr. R. B. Dunn of Greensboro, N. C. Second place went to Dr. H. D. Chamberlain of McArthur, Ohio, who took home the Atlantic City Trophy.**

**In the event limited to players 60 years of age and over, the Minneapolis Trophy was won by Dr. Houston. Other winners in this event were Drs. L. L. Iseman, Chicago; W. E. Baker, Des Moines, Iowa, and J. F. Hawkins, Providence, R. I.**

**Trophy emblematic of championship among the past presidents of the American Medical Golfing Association. Other prize winning scores were turned in by past presidents, Drs. M. M. Cullon, Nashville, Tenn., and E. G. Zabriskie, New York.**

**The Section event, a new feature this year, included sterling silver pitchers for the Sections on Surgery, Urology and Neurology, presented respectively by Drs. Harry E. Mock, Harry Culver and George W. Hall, all of Chicago.**

**Dr. T. A. Kyner, Kansas City, was tops in the surgical section. Dr. L. F. Huffman of Cleveland won the urology prize and Dr. C. Hunter Sheldon of Los Angeles had the best score among the neurologists.**

**Other prize winners in the first, second and third flights were Drs. S. E. Gates, Conneaut, Ohio; J. G. Matthews, Spokane, Wash.; H. W. Salter, Cleveland; C. A. Good, Rochester,**

**Minneapolis, Kansas City; W. R. Riddell, Jackson, Ohio; A. L. Ashmore, Wichita, Kan.; J. P. Hudock, Endicott, N. Y.; A. C. McCarty, Louisville, Ky.; J. B. Sampsell, Van Wert, Ohio; J. R. Fowler, Spencer, Mass.; H. A. Gestring, Kansas City; G. A. Hoke, Elyria, Ohio; H. C. Marsico, Valloyd Adair and A. J. Kirchner of Lorain, Ohio.**

**Dr. Harry E. Mock, Chicago, was elected president of the American Medical Golfing Association for the next year, Dr. John B. Morgan, Cleveland, first vice president, and Dr. H. V. Hubbard, Plainfield, N. J., second vice president. Bill Burns, Lansing, Mich., was reappointed executive secretary. Dr. Hous-ton, the retiring president, was made a member of the board of directors. The next tournament will be held in Atlantic City in June 1942.**

## LATIN AMERICA

**Prize for Prevention of Blindness.**—The National League for the Prevention of Blindness in Brazil recently awarded its National Prize, established by the professional journalists' club of Rio de Janeiro, to the Secretariat of Education and Health of the state of Bahia, with a tribute to the initiative of the secretary, Dr. Isaias Alves, according to the *Medico*. The award was made in recognition of the secretary's work in creating the first class for conservation of vision in one of the primary schools of São Salvador.

**Brazilian Congress of Ophthalmology.**—Dr. Harry S. Gradle, Chicago, president of the Pan American Congress of Ophthalmology, will be a guest at the fourth Brazilian Congress of Ophthalmology, to be held in Rio de Janeiro, June 26 to July 1. Dr. Gradle will deliver an address on "Glaucoma Capsulare." Prof. Octavio Rego Lopes, Rio de Janeiro, is president of the congress and Dr. Natalicio de Farias, Rio de Janeiro, is secretary. Members of the committee in charge of the scientific program include Drs. Ivo Corrêa Meyer and Santayana Mascarenhas, Porto Alegre; Linneu Silva, Minas Geraes; Moacyr E. Alvaro, Souza Martins and J. J. Britto, São Paulo; Isaac Salazar, Recife; Cesario de Andrade and Francisco Ferreira, Bahia; Paulo Cesar Pimentel, Rio de Janeiro; Deusdedit Coelho Duarte, Pará, and Leonidas Ferreira, Paraná. Official subjects of discussion chosen for the congress are the relationship between ophthalmology and legal medicine, constitution in ophthalmology and vision of school children.

## FOREIGN

**Personal.**—Lieut. Col. George S. Parkinson has been appointed acting dean of the London School of Hygiene and Tropical Medicine. He replaces Sir William Wilson Jameson, who has been appointed chief medical officer of the Ministry of Health.

**Rockefeller Foundation War Workers.**—Drs. Hugh H. Smith, recently in Bogotá, Colombia, Arnold P. Meiklejohn, Boston, and William D. Robinson, Ann Arbor, Mich., have been appointed members of the Rockefeller Foundation health commission for war work and were to sail for Europe on April 19, according to *Science*. Dr. Smith and Dr. Meiklejohn were to be attached to the British Ministry of Health and Dr. Robinson was to go to Madrid to study nutrition in Spain.

**Plastic Surgery in Great Britain.**—Nine centers for maxillofacial units are handling this service in the British Army and to these units come cases requiring plastic surgery. Three other units in the London area are under the leadership of Sir Harold D. Gillies, Mr. Archibald H. McIndoe and Mr. Rainsford Mowlem. Sir Harold is in charge of the entire group. Information comes to us to the effect that Sir Harold's home was struck by a bomb and that his eldest son is now a prisoner after a forced landing of his plane.

**Social Hygiene Worker Receives Snow Medal.**—Mrs. Sybil Neville Rolfe, secretary general of the British Social Hygiene Council, received the William Freeman Snow Award at the recent annual meeting of the American Social Hygiene Association in Philadelphia. Mrs. Rolfe was secretary of the National Council for Combating Venereal Diseases from 1915 to 1925 and continued as secretary general when that organization became the British Social Hygiene Council. The award was accepted for her in her unavoidable absence by her cousin, Dr. Helen Ingleby, Philadelphia. This is the fourth Snow award. The previous recipients were Dr. Edward L. Keyes, New York; Dr. Thomas Parran, surgeon general, U. S. Public Health Service, and Gen. John J. Pershing, Washington, D. C.

## Foreign Letters

### BUENOS AIRES

(From Our Regular Correspondent)

March 17, 1941.

#### Second Pan American Congress for Endocrinology

The second Pan American Congress for Endocrinology met March 5-8 in Montevideo, Uruguay. It was exceptionally well attended. Dr. Juan Cesar Mussio Fournier, minister of public health and director of the Institute of Endocrinology of Montevideo, was chairman. Official delegates were present from the other South American countries. The United States was represented by Drs. Oscar Riddle, George W. Corner, R. L. Zwemer, H. M. Evans and F. C. Koch, with Dr. Elmer Sevringhaus head of the delegation. A scientific exhibit was on display with numerous clinical diagrams, pictures and graphs and an anatomic collection from the physiologic institute of Buenos Aires. Prof. B. A. Houssay pointed out that the progress of endocrinology was hindered by charlatans as well as by endocrinologists who with literary skill and a productive imagination embellished the facts of science. The true progress of endocrinology, however, is due to experimental and clinical research workers whose serious investigations are conducted in the privacy of the laboratory and the ward. In the industrial production of hormones and organotherapeutic products there was a danger that the pressure of material considerations was such as to confuse the distinction between the pure scientist and the industrial technician. Dr. Sevringhaus extended the greetings of the Oficina Sanitaria Panamericana. He called for a closer definition of terminological usage such as that of catalysis, correlation and others.

The sections included those of histology and pathologic anatomy, biology, physiology, internal medicine, cardiology, pediatrics, psychiatry, therapy, radiology, surgery, obstetrics and gynecology, urology, social medicine and dentistry. Dr. Sevringhaus opened the scientific proceedings by discussing the contributions of North American research workers to endocrinology. Professor Houssay discussed insulin secretion and its regulation. Dr. Herbert M. Evans of California spoke on internal secretion of the anterior lobe of the hypophysis. Dr. Riddle of the Carnegie Institute discussed the role which hormones of the hypophysis play in carbohydrate metabolism. Dr. Pou Orfila discussed the syndromes produced by sex hormones in women and stressed the need of basing therapy on clearly determined clinical pictures so as to avoid disturbances arising not from the disease but from mistaken therapy. Dr. E. E. Krapf called attention to grave manifestations of depression in European women who had recently immigrated, occurring in connection with the change in the seasons and with menstrual dysfunction. Dr. Buño spoke on endocrine disturbances in school children on the basis of 1,000 cases. Drs. O. and A. Pichón Riviere treated the subject of oligothymia and endocrine disorders. Dr. Camacho the medicosocial significance of the colloid goiter and Dr. Mira, formerly professor of psychiatry in Barcelona, the present status of endocrine psychoses. Prof. Del Río Ortega discussed the functional structure of the epiphysis.

In the section for physiology, Dr. W. Wolf of the United States discussed the value and determination of basal metabolism. J. A. Collazo, A. Munilla, José M. Jorge and Mario Nirenstein treated the relations between vitamins and hormones. A. V. Di Cío and M. Schtingart discussed the effect of vitamin C on the activity of the testicular hormones. In the section for pediatrics, Dr. Cerviño spoke on temporary forms of hypothyroidism in children. Dr. Cibils Aguirre and his collaborators discussed endocrine disturbances in children and Dr. Perez del Castillo, dystrophy and growth. Drs. Rascovsky, Pichón Riviere and Saltzman schematized the constituent elements of

the prepuberal adiposogenital syndrome in males, based on 100 cases. In the section of cardiology Prof. De Castro of Brazil discussed hypertension and the climacteric. In the combined sections of psychiatry and social medicine Dr. Alcúña and Halperín Pinos reported on the menstruation of Argentinean women in the city of Buenos Aires. Dr. Cantillo and Dr. Esteves Balado discussed the role of endocrine disturbances in schizophrenia; Dr. Gregorio Bermann, hermaphroditism and Drs. L. Fraenkel and Saessler, schizophrenia and infantilism.

In the combined sections of surgery and gynecology, A. Lipschuetz of Santiago de Chile read a paper on the experimental endocrine foundations of the origin of epithelial tumors in the female genital tract. L. Fraenkel and his collaborators discussed the relations between the mammary glands and internal secretions, and Del Castillo, Mcmbrives and De la Balze gynecomastia and pulmonary carcinoma. In the physiologic section, Professor Houssay and Dr. Del Castillo discussed the thymus and the adrenal glands. The National Institute of Nutrition in Buenos Aires was represented by a number of speakers. Prof. Pedro Escudero discussed the effect of nutrition on diabetes in children and the effect of the relations between the fat and carbohydrate content of food on the structure of the pancreas. In the section for biology Dr. Kcpller spoke on the diagnosis and treatment of tumors of the adrenal cortex, and Dr. Plá in the section of internal medicine on the function of the thyroid gland.

In the concluding session the memory of Professor Banting, who recently lost his life in an airplane crash, was honored by adoption of a resolution that the picture and a biographic sketch of the deceased be included in the publication of the congress. Two recommendations presented by Dr. Sevringhaus were adopted, namely that the publications in the field of endocrinology appear in Spanish, Portuguese and English and the participation by the congress in the development of standardizing methods analogous to those conducted by the North American Society for the Study of Internal Secretions. The next congress is to meet in 1943 in Buenos Aires under the direction of Prof. Bernardo A. Houssay.

The congress accomplished much in establishing closer relations between North and South American research workers. It was the first time that the two continents held joint sessions in this field of scientific inquiry. The contributions of Professors Evans, Sevringhaus, Corner, Koch, Riddle, Selye of Canada, Martins of Brazil, of the Uruguayan research men and of Bernardo Houssay, Enrique del Castillo, Oscar Arias, Juan T. Lewis and Pedro Escudero were highly appreciated.

Between March 13 and 17, on invitation of the Argentine Society for Endocrinology, lectures were given by Prof. G. W. Corner on the menstrual cycle in monkeys, by Thales Martins of Rio de Janeiro on sex hormones, by E. Kepler on the clinical diagnosis of tumors of the adrenal cortex, by A. Lipschuetz of Santiago de Chile on the experimental endocrine foundations of tumor causation, by H. M. Evans on gonadotropic substances of the hypophysis, by Elmer Sevringhaus on the diagnosis and treatment of the menopause and by A. Selye on alarm reactions. Besides, lectures were delivered on invitation of the medical faculties of Rosario and Córdoba.

## Marriages

WILLIAM EDWARD BONES, Pulaski, Va., to Miss Junc Constance Norris at Melbourne, Australia, June 13.

WALTER A. FENSTERMACHER, Rochester, N. Y., to Miss Dorothy M. Shaw, May 5.

JOHN ELBERT DUNLAP to Miss Marianne Touchstone, both of Dallas, Texas, May 23.

ELLERTON GORDON ALDRICH to Miss Isobel Mary Millar, both of Detroit, May 24.

## Deaths

**Bransford Lewis** \* St. Louis; Missouri Medical College, St. Louis, 1884; an Affiliate Fellow of the American Medical Association and a member of its House of Delegates in 1913; lecturer in genitourinary surgery at his alma mater from 1893 to 1895; professor of urology at St. Louis University School of Medicine from 1900 to 1930 and since 1930 professor emeritus; member of the American Association of Genito-Urinary Surgeons; member and past president of the American Urological Association; fellow of the American College of Surgeons; past president of the Mississippi Valley Medical Association; in 1933 vice president of the Pan American Medical Congress; assistant superintendent of St. Louis City Hospital in 1889, on the staff from 1902 to 1905 and from 1910 to 1912; on the staff of the Missouri Pacific Hospital from 1892 to 1896, Rebekah Hospital from 1901 to 1914, Deaconess Hospital from 1905 to 1912, Frisco Hospital from 1898 to 1915; since 1912 urologist to St. John's Hospital; translated from the German "Genitourinary Diagnosis and Therapy for Urologists and General Practitioners," by Dr. E. Portner; co-author of "Cystoscopy and Urethroscopy"; edited a "History of Urology" in 1933, and wrote the chapter on the history of the American Urological Association; contributed largely to the development of the modern cystoscope; aged 78; died, May 18, at his summer home near St. Clair, Mo.

**Manford Repp Waltz** \* Seattle; Northwestern University Medical School, Chicago, 1918; member of the American Laryngological, Rhinological and Otolological Society and the Pacific Coast Oto-Ophthalmological Society; fellow of the American College of Surgeons; on the staffs of the Swedish Hospital, Providence Hospital, Seattle General Hospital and the Children's Orthopedic Hospital; aged 50; died, April 20, of cerebral embolism.

**Aurelius Rives Shands**, Washington, D. C.; University of Maryland School of Medicine, Baltimore, 1884; member of the Medical Society of the District of Columbia and the Southern Surgical Association; fellow of the American College of Surgeons; past president of the American Orthopedic Association; formerly clinical professor of orthopedic surgery, George Washington University School of Medicine; aged 80; died, April 27, of coronary thrombosis, arteriosclerosis and pneumonia.

**Harold Lynwood Warwick** \* Fort Worth, Texas; University of Georgia Medical Department, Augusta, 1900; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; past president of the Tarrant County Medical Society; served during the World War; on the staffs of St. Joseph's and Methodist hospitals; aged 63; died, April 28, of carcinoma of the bladder.

**Alfred Edwin Baker** \* Richmond Hill, N. Y.; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1906; fellow of the American College of Surgeons; attending obstetrician and gynecologist, Queens General and Jamaica hospitals, Jamaica, and Creedmoor State Hospital, Queens Village; on the associate staff of the Mary Immaculate Hospital, Jamaica; aged 65; died, April 29, of coronary thrombosis.

**Lewis Marshall Van Meter** \* Denver; University of Virginia Department of Medicine, Charlottesville, 1897; fellow of the American College of Surgeons; served during the World War; on the staffs of the Denver General Hospital, Presbyterian Hospital, Mercy Hospital and St. Anthony's Hospital; aged 70; died in April of coronary sclerosis.

**Edward Marion Frank Stephen** \* Galveston, Texas; University of Texas School of Medicine, Galveston, 1916; formerly assistant surgeon in the United States Public Health Service; past president of the Galveston County Medical Society; on the staff of the United States Marine Hospital; aged 54; died, April 25, of hypostatic pneumonia.

**Allee Gardner Whittinghill Davis**, Owensboro, Ky.; University of Michigan Medical School, Ann Arbor, 1933; member of the Kentucky State Medical Association; formerly secretary of the Daviess County Medical Society; aged 32; died, April 20, in the Owensboro-Daviess County Hospital of toxemia following childbirth.

**Jane Drusie McIntosh Wright**, Clear Lake, Iowa; State University of Iowa College of Medicine, Iowa City, 1898; member of the Iowa State Medical Society; past president of the State Society of Iowa Medical Women; aged 73; died, April 26, in Mason City of injuries received in a fall in March.

**Charles White Berry**, Charlottesville, Va.; Columbia University College of Physicians and Surgeons, New York, 1896;

formerly associate professor of clinical pediatrics at the New York Post-Graduate Medical School; served during the World War; aged 70; died, April 30, of aplastic anemia.

**Arthur Eddy West**, Kalamazoo, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1897; member of the Michigan State Medical Society; aged 66; died, April 22, in the Bronson Hospital of cirrhosis of the liver, arteriosclerosis and heart disease.

**Thomas Wynn Morgan** \* Virden, Ill.; Rush Medical College, Chicago, 1900; served during the World War; aged 62; died, April 9, in the Barnes Hospital, St. Louis, of respiratory paralysis following a cranial operation for Ménière's disease.

**Arch Burl Thompson** \* Milwaukee; University of Louisville (Ky.) Medical Department, 1914; member of the Indiana State Medical Association; on the staff of the Veterans Administration Facility; aged 53; died, April 18, of coronary occlusion.

**Delbert S. Wilbur**, Naples, N. Y.; Albany Medical College, 1897; member of the Medical Society of the State of New York; for many years health officer and member of the board of education; aged 72; died, April 19, of cerebral meningitis.

**William J. L. Millar**, Rensselaer Falls, N. Y.; University of Buffalo School of Medicine, 1893; served as health officer of Rensselaer Falls; school physician and a member of the school board; aged 75; died, April 15, of diabetes mellitus.

**Clarence Henry Willig**, Mars, Pa.; Temple University School of Medicine, Philadelphia, 1933; member of the Medical Society of the State of Pennsylvania; aged 39; died, April 24, in St. Joseph's Hospital, Pittsburgh, of coronary occlusion.

**Roland Earl Taylor**, Windsor, Ont., Canada; University of Toronto Faculty of Medicine, 1922; served during the World War; on the staffs of the Grace Hospital, Metropolitan General Hospital and the Hotel Dieu; aged 44; died, March 14.

**Bernard Joseph Mulholland**, Lawrence, Mass.; Baltimore Medical College, 1906; member of the Massachusetts Medical Society; aged 57; died, April 16, in the Mary E. McGowan Memorial Hospital, Methuen, of cirrhosis of the liver.

**John William Phares** \* Evansville, Ind.; Kentucky School of Medicine, Louisville, 1897; fellow of the American College of Surgeons; on the staff of the Protestant Deaconess Hospital; aged 72; died, April 27, of coronary thrombosis.

**Louis M. Pearson**, Wausau, Wis.; Rush Medical College, Chicago, 1904; member of the State Medical Society of Wisconsin; served during the World War; aged 62; died, April 21, in the Memorial Hospital of chronic myocarditis.

**Marion Margaret Wallace** \* Chicago; University of Illinois College of Medicine, Chicago, 1934; aged 53; died, April 15, in the Women and Children's Hospital of cerebral hemorrhage and hypertensive cardiovascular renal disease.

**Louis Ruch**, Englewood, N. J.; Cornell University Medical College, New York, 1911; aged 61; on the staff of the Holy Name Hospital and the Englewood Hospital, where he died, April 26, of cerebral hemorrhage and hypertension.

**Sam Sharp Templin**, Galveston, Texas; University of Texas School of Medicine, Galveston, 1926; instructor in medicine at his alma mater; on the staff of the John Sealy Hospital; aged 48; died, April 15, of coronary thrombosis.

**Reuben Golding Blackburn**, Marion, S. C.; Medical College of the State of South Carolina, Charleston, 1910; formerly member of the state legislature; aged 62; died, April 9, of diabetes mellitus and coronary arteriosclerosis.

**Eugene Theodore Stephenson** \* \* \* \* \* George Washington University School of Medicine, 1907; member of the Medical Society of \* \* \* \* \* mbia; aged 68; died, April 12, of coronary thrombosis.

**George Spencer Lape**, Binghamton, N. Y.; Albany Medical College, 1904; member of the Medical Society of the State of New York; aged 62; died, March 11, of arteriosclerosis, Parkinson's syndrome and cerebral thrombosis.

**Joseph Michael O'Maley**, Miami, Fla.; Miami Medical College, Cincinnati, 1909; served during the World War; aged 68; died, April 11, in St. Francis Hospital, Miami Beach, of coronary sclerosis and bronchopneumonia.

**Sarah Felt Richardson**, Munfordville, Ky.; Hering Medical College, Chicago, 1898; member of the Kentucky State Medical Association; secretary of the Hart County Medical Society; aged 70; died, April 7.

**Hosea M. Rymer**, Harrisville, W. Va.; University of Louisville (Ky.) Medical Department, 1893; member of the West Virginia State Medical Association; aged 71; died, April 15, of angina pectoris.

**James Wilbur Brandon**, Big Clifty, Ky.; University of Louisville (Ky.) Medical Department, 1906; member of the Kentucky State Medical Association; aged 59; died, April 30, of cerebral hemorrhage.

**Charles K. Kernan**, Pulaski, Va.; University of Maryland School of Medicine, Baltimore, 1887; aged 79; died, April 18, in the Southwestern State Hospital, Marion, of arteriosclerosis and pulmonary tuberculosis.

**Arthur Alexander Johnston Simpson**, Kintail, Ont., Canada; M.B., Victoria University Medical Department, Coburg, 1903; M.D., Trinity Medical College, Toronto, 1904; aged 77; died, March 21.

**William A. Starkey**, Atlanta, Texas; Gate City Medical College, Texarkana, Ark., 1906; member of the State Medical Association of Texas; aged 71; died, April 21, of myocarditis and hypostatic pneumonia.

**Constantinos N. Lyras**, Long Beach, N. Y.; National University of Athens School of Medicine, Greece, 1895; aged 68; died, March 22, of cerebral arteriosclerosis, bronchopneumonia and hypertension.

**Ritchie Christian Ovens**, Jersey City, N. J.; New York Homeopathic Medical College and Hospital, New York, 1901; served during the World War; aged 62; died, April 11, of cerebral hemorrhage.

**William Robertson**, Elora, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1890; for many years medical officer of health for Pilkington township; aged 76; died, March 30.

**Hugh James White** ♂ Hammond, Ind.; Northwestern University Medical School, Chicago, 1906; served during the World War; aged 61; died, April 21, in St. Margaret's Hospital of pneumonia.

**Joseph B. Shannon**, Fort Worth, Texas; Maryland Medical College, Baltimore, 1905; member of the State Medical Association of Texas; aged 59; died, April 19, of aneurysm and arteriosclerosis.

**Roger Francis Murray**, Union City, N. J.; Georgetown University School of Medicine, Washington, D. C., 1930; on the staff of St. Mary's Hospital; aged 37; died, April 14, of heart disease.

**Herschel S. Lowrance**, Topeka, Kan.; American Medical College, St. Louis, 1881; for many years on the staff of the Kankakee (Ill.) State Hospital; aged 85; died, April 12, of myocarditis.

**Jerome Lloyd Silverstein**, San Francisco; Stanford University School of Medicine, 1939; intern at the Stanford University Hospitals; aged 26; died, March 30, of bronchopneumonia.

**William Richard Sears**, Brooklyn; Long Island College Hospital, Brooklyn, 1900; served during the World War; at one time a ship's surgeon; died, April 18, in the Kings County Hospital.

**Berthold F. Bertram** ♂ Detroit; Michigan College of Medicine and Surgery, Detroit, 1892; aged 70; died, April 30, in St. Joseph Hospital of acute dilatation of the heart and hypertension.

**William Penn Sims** ♂ Burkburnett, Texas; College of Physicians and Surgeons, Memphis, Tenn., 1911; served during the World War; aged 52; died, March 19, of coronary occlusion.

**Edwin Alonzo Clark**, Los Angeles; Western Reserve University Medical Department, Cleveland, 1890; aged 77; died, March 21, of arteriosclerosis, hypertension and heart disease.

**Paul Edouard Garneau**, Quebec, Que., Canada; Laval University Faculty of Medicine, Quebec, 1924; professor of descriptive anatomy at his alma mater; aged 43; died, March 11.

**Fred B. Kell**, San Bernardino, Calif.; St. Louis University School of Medicine, 1913; member of the California Medical Association; aged 53; died, April 23, of coronary sclerosis.

**Delphine Hanna**, Castile, N. Y.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1890; aged 86; died, April 16, in the Greene Sanitarium of arteriosclerosis.

**Albert Tennyson Webb**, Santa Barbara, Calif.; University of Pennsylvania Department of Medicine, Philadelphia, 1891; also a dentist; aged 75; died, April 28, in Las Vegas, Nev.

**William Frank Neide** ♂ Seaford, Del.; Hahnemann Medical College and Hospital of Philadelphia, 1931; aged 35; died, April 13, in the Mound Park Hospital, St. Petersburg, Fla.

**Elijah Leonard Hardman**, Allerton, Ill.; Western Reserve University Medical Department, Cleveland, 1891; aged 78; died, April 21, in the Carle Memorial Hospital, Urbana.

**Frederic Clarence Calvert**, San Diego, Calif.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1908; aged 57; died, March 16, of pulmonary embolism.

**William Spencer Richards**, Buffalo; University of the City of New York Medical Department, 1889; aged 74; died, March 6, of cardiovascular renal disease and uremia.

**Alexander Penrose Forbes Gammack**, South Bend, Ind.; University of Aberdeen Faculty of Medicine, Scotland, 1889; aged 73; died, April 20, of congestive heart disease.

**William Ford Ward**, Binghamton, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1897; aged 67; died, March 11, of rheumatic cardiovascular disease.

**Lillian Boldemann**, San Francisco; Hahnemann Hospital College of San Francisco, 1896; aged 69; died, March 19, of heart disease and carcinoma of the stomach.

**William F. Sibbett**, Douglas, Ga.; Atlanta Medical College, 1888; member of the Medical Association of Georgia; at one time mayor; aged 87; died, March 11.

**Samuel Bismarck McLeary**, Columbus, Texas; Jefferson Medical College of Philadelphia, 1889; aged 74; died, April 3, of arthritis deformans and arteriosclerosis.

**John Paul Stawicki**, Chicago; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1908; aged 61; died, April 18.

**John Jay Williams**, St. Louis; College of Physicians and Surgeons, Keokuk, Iowa, 1878; aged 88; died, April 23, of chronic myocarditis and arteriosclerosis.

**Horace Percy Wilkins**, Birmingham, Ala.; McGill University Faculty of Medicine, Montreal, Que., Canada, 1887; aged 74; died, March 5, in Miami, Fla.

**Wenceslao Olvera Zuniga**, Los Angeles; Universidad Nacional Facultad de Medicina, Mexico, D. F., 1909; aged 58; died, March 3, of a ruptured spleen.

**Fred A. Perrigo**, Huntington Park, Calif.; Hahnemann Medical College and Hospital, Chicago, 1898; aged 73; died, March 29, of coronary thrombosis.

**Frank Hastings Starr**, Corning, N. Y.; Bellevue Hospital Medical College, New York, 1889; aged 76; died, April 16, of cardiac decompensation and uremia.

**Benjamin Alexis Sherrell**, Deltrose, Tenn.; Vanderbilt University School of Medicine, Nashville, 1892; aged 79; died, April 15, of cerebral hemorrhage.

**William H. Murray**, Waterbury, Conn.; Bellevue Hospital Medical College, New York, 1890; aged 76; died, April 22, of chronic myocarditis.

**George W. B. Swaim**, Seattle; Missouri Medical College, St. Louis, 1885; aged 83; died, April 12, of bronchopneumonia and chronic myocarditis.

**John Andrew Kane**, Cobalt, Ont., Canada; L.R.C.P., L.R.C.S., Edinburgh, and L.F.P.S., Glasgow, Scotland, 1906; aged 63; died, March 8.

**John Edward Sutton** ♂ Albion, N. Y.; University of Buffalo School of Medicine, 1883; aged 85; died, April 17, of cerebral hemorrhage.

**Alfred P. Rainier**, Remington, Ind.; St. Louis College of Physicians and Surgeons, 1903; aged 62; died, April 11, of secondary anemia.

**Julia A. Meyer**, Los Angeles; Homeopathic Medical College of Missouri, St. Louis, 1904; aged 75; died, March 9, of arteriosclerosis.

**Elwin Wilder Gammon**, Orlando, Fla.; Rush Medical College, Chicago, 1892; aged 74; died, April 23, in Fort Lauderdale.

**John Fraser Lockwood**, Whittier, Calif.; Albany (N. Y.) Medical College, 1881; aged 86; died, March 2, of coronary thrombosis.

**Thomas Walter Blanshard**, Burlington, Ont., Canada; University of Toronto Faculty of Medicine, 1905; died, March 12.

**Gustave Paul Gehring**, San Diego, Calif.; Jefferson Medical College of Philadelphia, 1890; aged 84; died, March 15, of senility.

**Leonard G. Cromer**, Union City, Ind.; Medical College of Ohio, Cincinnati, 1890; aged 82; died, April 29.

**Carrie Yetter**, San Francisco; California Medical College, San Francisco, 1890; aged 86; died, March 5.

**B. Wilbur Breedlove**, Downs, Ala.; Atlanta (Ga.) Medical College, 1893; aged 68; died, April 30.



## Bureau of Investigation

### CEASE AND DESIST ORDERS Abstracts of Certain Federal Trade Commission Releases

The work of the Federal Trade Commission, in helping to protect the public against misrepresentation or fraud in the medical as well as other fields, has been greatly extended by the provisions of the Wheeler-Lea Amendment to the Federal Trade Commission Act. The Food, Drug and Cosmetic Act of 1938 added to the Food and Drug Administration's control of the advertising claims and statements made on the labels of medicines or on the carton or in the accompanying leaflet, whereas what might be termed collateral advertising, that which appears in newspapers and magazines and over the air, comes more actively under the purview of the Federal Trade Commission, by virtue of the Wheeler-Lea Amendment.

THE JOURNAL has at various times commented on the activities of the Federal Trade Commission in this connection, even before the Wheeler-Lea Amendment gave it its added rights. In some cases the Commission may accept from the person or concern involved a stipulation that the objectionable practices or claims cited will be discontinued. In other cases the Commission issues what is known as a Cease and Desist Order, in which the individual, manufacturer or distributor cited is ordered to cease and desist from practices which have been declared objectionable.

Abstracts of some of the orders issued during 1940 follow:

**"Man's" Products.**—Edward L. Leisenring, trading as U. S. Drug and Sales Company, U. S. Drug Laboratories and U. S. Drug Company, and Gordon Leisenring, both of Denver, put out some products under this brand. Apparently all were essentially the same except for being sold in different strengths. The names used were "Man's Tonic," "Man's Pep Tonic," "U. S. Special Tablets" and "Sextogen Capsules for Men or Women." On June 17, 1940, the Federal Trade Commission, having found false claims in the advertising, ordered the defendants to cease and desist from further representing that their preparations are safe, competent or reliable tonics or aphrodisiacs, or are scientific treatments for strengthening or rejuvenating the glands or sexual organs of men or women, or that these products have any value in the treatment of debility, or to fail to make clear in the advertising that these products may result in serious or irreparable injury to the health of the user.

**Monticello Drug Company.**—On July 6, 1940, this Jacksonville, Fla., concern was ordered by the Federal Trade Commission to cease and desist from representing that its preparations check, cure or stop colds; constitute a complete treatment for colds, whether taken or administered singly or in conjunction with each other; cure malaria, or are the speediest remedies known for colds, malaria, chills and fever, or bilious fever due to malaria. The order also forbids representations that the respondent's preparations are commonly prescribed by physicians. The Bureau of Investigation's records show that this concern puts out something called "666" in three forms—liquid, tablet and salve. In May 1935 the government declared that the salve was sold under fraudulent claims as an alleged remedy for catarrh, chills, streptococcal infections and some other things. The government chemists reported that it was composed essentially of volatile oils, including those of camphor, menthol and eucalyptus, and a coniferous oil, such as cedar leaf oil, in petrolatum. The Ohio Dairy and Food Division once reported finding the "666 Liquid" to be a watery solution containing citric acid, iron, manganese and quinine.

**Periodic Relief Pills.**—These were put out as a remedy for delayed menstruation by one William W. Kelso, Seattle, trading as Northwestern Products Company and as Northwestern Health Clinic. Kelso was ordered by the Federal Trade Commission on July 1, 1940, to discontinue any advertisements of his product that failed to reveal that its use might result in serious and irreparable injury to health.

**Pow-O-Lin.**—This product was put out by the Herb Juice-Penol Company, Inc., trading as Pow-O-Lin Laboratories, Danville, Va. It was dealt with at some length in THE JOURNAL, June 25, 1938, page 2170. That article disclosed that from the A. M. A. chemists' report it was concluded that the nostrum was essentially a water-alcohol solution of plant extracts flavored with licorice. The article also brought out that the Federal Trade Commission on Dec. 23, 1937, had represented that the Pow-O-Lin people had signed a stipulation with the commission to cease advertising that "Pow-O-Lin" was "capable of relieving biliousness, nervousness, indigestion and countless ills due to constipation, unless these assertions are limited to temporary relief from constipation." Apparently the concern did not discontinue all its advertising misrepresentations, however, for on June 10, 1940, the Commission issued a definite order directing this outfit to cease and desist from implying certain things unwarrantedly. Among these were that Pow-O-Lin is a cure or remedy for constipation and "faulty elimination" characterized by and associated with symptoms such as biliousness, indigestion, gas pains, headaches, dizziness, pains in the back or chest, stiffness of the joints, swollen feet or ankles, nervousness, insomnia, loss of appetite or lack of energy.

## Medical Examinations and Licensure

### COMING EXAMINATIONS NATIONAL BOARD OF MEDICAL EXAMINERS EXAMINING BOARDS IN SPECIALTIES

Examinations of the National Board of Medical Examiners and Examining Boards in Specialties were published in THE JOURNAL, June 14, page 2714.

#### BOARDS OF MEDICAL EXAMINERS

ARIZONA: Phoenix, July 1-2. Sec., Dr. J. H. Patterson, 826 Security Bldg., Phoenix.

CALIFORNIA: Oral examination (required when reciprocity application is based on a state certificate or license issued ten or more years before filing application in California), Los Angeles, July 14. Written, San Francisco, June 30-July 3. Sec., Dr. Charles B. Pinkham, 1020 N St., Sacramento.

CONNECTICUT: Medical, Written, Hartford, July 8-9. Endorsement, Hartford, July 22. Sec., Dr. Creighton Barker, 258 Church St., New Haven. Homeopathic, Derby, July 15-16. Sec., Dr. Joseph H. Evans, 1488 Chapel St., New Haven.

DELAWARE: July 8-10. Sec., Medical Council of Delaware, Dr. Joseph S. McDaniel, 229 S. State St., Dover.

FLORIDA: Jacksonville, June 23-24. Sec., Dr. William M. Rowlett, Box 786, Tampa.

HAWAII: Honolulu, July 14-17. Sec., Dr. James A. Morgan, 48 Young Bldg., Honolulu.

IDAHO: Boise, Oct. 7. Dir., Bureau of Occupational License, Mr. Walter Curtis, 355 State Capitol Bldg., Boise.

ILLINOIS: Chicago, June 24-26. Supt. of Registration, Mr. Lucien A. File, Department of Registration and Education, Springfield.

MAINE: Augusta, July 1-2. Sec., Board of Registration in Medicine, Dr. Adam P. Leighton, 192 State St., Portland.

MASSACHUSETTS: Boston, July 8-11. Sec., Board of Registration in Medicine, Dr. Stephen Rushmore, 413-F State House, Boston.

MISSISSIPPI: Jackson, June 25-26. Asst. Sec., State Board of Health, Dr. R. N. Whitfield, Jackson.

MONTANA: Helena, Oct. 6-8. Sec., Dr. Otto G. Klein, First National Bank Bldg., Helena.

NEVADA: Reciprocity with oral examination, Aug. 4. Sec., Dr. Fred M. Anderson, 215 N. Carson St., Carson City.

NEW HAMPSHIRE: Concord, Sept. 11-12. Sec., Board of Registration in Medicine, Dr. T. P. Burroughs, State House, Concord.

NEW MEXICO: Santa Fe, Oct. 13-14. Sec., Dr. Le Grand Ward, 135 Sena Plaza, Santa Fe.

NEW YORK: Albany, Buffalo, New York and Syracuse, June 23-26. Chief, Bureau of Professional Examinations, Mr. Herbert J. Hamilton, 315 Education Bldg., Albany.

NORTH DAKOTA: Grand Forks, July 1-4. Sec., Dr. G. M. Williamson, 4½ S. Third St., Grand Forks.

OREGON: Portland, July 24-26. Final date for filing application is July 9. Exec. Sec., Miss Lorette M. Conlee, 608 Failing Bldg., Portland.

PENNSYLVANIA: Philadelphia and Pittsburgh, July 8-12. Act. Sec., Bureau of Professional Licensing, Department of Public Instruction, Mrs. Marguerite G. Steiner, 358 Education Bldg., Harrisburg.

RHODE ISLAND: July 10. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

SOUTH CAROLINA: Columbia, June 23-25. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

SOUTH DAKOTA: Pierre, July 15-16. Dir., Medical Licensure, Dr. J. F. D. Cook, State Board of Health, Pierre.

WASHINGTON: Seattle, July 21-23. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

WEST VIRGINIA: Wheeling, July 7-9. Sec., Public Health Council, Dr. C. F. McClintic, State Capitol, Charleston.

WISCONSIN: Milwaukee, June 24-27. Sec., Dr. H. W. Shutter, 425 E. Wisconsin Ave., Milwaukee.

\* Basic Science Certificate required.

#### BOARDS OF EXAMINERS IN THE BASIC SCIENCES

DISTRICT OF COLUMBIA: Washington, Oct. 20-21. Sec., Dr. George C. Ruhland, 203 District Bldg., Washington.

IOWA: Des Moines, July 8. Dir., Division of Licensure and Registration, State Department of Health, Mr. H. W. Grefe, Capitol Bldg., Des Moines.

NEBRASKA: Lincoln, Oct. 7-8. Dir., Bureau of Examining Boards, Mrs. Jeannette Crawford, 1009 State Capitol Bldg., Lincoln.

OREGON: Corvallis, July 12. Sec., State Board of Higher Education, Mr. Charles D. Byrne, University of Oregon, Eugene.

RHODE ISLAND: Providence, Aug. 20. Acting Chief, Division of Examiners, Mr. E. Clyde Thomas, 366 State Office Bldg., Providence.

WASHINGTON: Seattle, July 17-18. Sec., Department of Licenses, Mr. Nelson N. Vaughan, Olympia.

### Iowa Reciprocity Report

The Iowa State Board of Medical Examiners reports 9 physicians licensed to practice medicine by reciprocity from January 10 through March 14. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine	.....	(1929)	Illinois
Northwestern University Medical School	.....	(1938)	Minnesota
University of Kansas School of Medicine	.....	(1923)	Kansas
College of Physicians and Surgeons of Baltimore	.....	(1908)	W. Virginia
John A. Creighton Medical College	.....	(1915)	Nebraska
University of Nebraska College of Medicine	.....	(1916), (1934)	Nebraska
Temple University School of Medicine	.....	(1932)	Penn.
University of Wisconsin Medical School	.....	(1928)	Wisconsin

## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Medical Practice Acts: Unlicensed Practice of Chiropractic; Entrapment.**—Although not possessing a license to practice medicine in the state of Texas, the defendant had, nevertheless, been engaged in the practice of chiropractic in that state for sixteen years. An investigator for the Texas State Board of Medical Examiners noticed a sign in front of the defendant's home which read "J. M. Peery, Chiropractor" and discovered that the defendant was not registered with the county clerk as required by law. The investigator made arrangements with a woman to apply to the defendant for treatment and gave to her \$2 to pay for the treatment. In a subsequent prosecution of the defendant for practicing medicine without a license, this woman testified that the defendant had treated her for bronchitis, the treatment consisting, among other things, of placing the patient on a cot and connecting "her body up with some kind of an electrical machine." The witness also testified that she paid the defendant \$2 for the treatment. The defendant denied having received any money for his services but admitted that he gave the treatment and that he did not possess a license to practice medicine. From a verdict of guilty in the trial court, the defendant appealed to the court of criminal appeals of Texas.

The defendant contended, among other things, that the prosecution was the result of an entrapment. But, said, the court of criminal appeals, entrapment has been legally defined as "the seduction or improper inducement to commit a crime, and not the testing by trap, trickiness, or deceit of one suspected." It carries with it a presumption that the officer or agent manufactured the offense and then incited the accused into committing it for the purpose of prosecution. The evidence in this case, however, showed that the defendant, by virtue of the sign in front of his house, held himself out to the public as a chiropractor willing to accept patients. The woman who applied for treatment was actually suffering from bronchitis. She did not know that the defendant was violating the law and knew nothing of the investigator's connection with the board of medical examiners or of his motive in referring her to the defendant and paying for her treatment. The gist of the charge against the defendant was that he practiced medicine without a license. This offense was clearly proved, in the opinion of the court, and merely furnishing money to a person and telling her to go to the defendant for treatment did not constitute entrapment. The defendant's conviction was therefore sustained. —*Peery v. State*, 134 S. W. (2d) 283 (Texas, 1939).

**Malpractice: Right of Physician to Restrict Area of Practice.**—The defendants were associated in the practice of medicine. They limited the area of their practice by customarily refusing to accept or treat a patient residing more than 8 miles from the locality in which their office was located. A woman sustained a severe cut on her leg and was taken to the defendants' office, where proper treatment was administered. The patient was told to return to the office the following day. This she did not do. On the contrary, she and her husband decided to go to a community 20 miles distant to the home of the husband's brother. The condition of the patient's leg became worse and the husband telephoned the defendants several times. At first certain home treatments were suggested but later, on being requested to make the 20 mile trip to see the patient, the defendants suggested that the services of another, more conveniently located physician be obtained. One of the defendants made arrangements for another physician to see the patient but before this physician could respond to the call the husband had made other arrangements. The wound on the patient's leg became infected and she was removed to a hospital, where she remained, seriously ill, for about three months. Subsequently the patient and her husband sued the defendants, contending, among other things, that the defendants failed in their duty to the patient by refusing to make the 20 mile trip to continue

treatments. From a judgment for the defendants, the plaintiffs appealed to the district court of appeal, fourth district, California.

The relation of physician and patient, said the court, is in its inception created by contract, express or implied. The contract may be general or may be limited by special terms. When general, the physician may undertake the treatment of the patient during the course of an illness wherever the patient may be, but a physician is under no obligation to enter into such contract. He may limit his obligation to undertaking to treat the patient only for a certain ailment or injury at a certain place and at a specified time. When he so limits his employment the physician is not required to treat the patient at another place or to follow him into another city. In speaking of a contract of employment of a physician it was said in *Roos v. Jansen*, 30 Cal. App. Supp. 2d 773, 78 P. (2d) 476: "In the absence of a special agreement as to the place where a contract is to be performed, it is to be deemed performable at the creditor's place of business . . . or, in the absence of a contrary showing, a contract is to be deemed performable where it is made." The plaintiffs in the present case complained of instructions given by the trial court which in effect told the jury that as the contract to treat the patient was made in the community in which the office of the defendants was located it followed that it was to be performed there and that in the absence of proof of a contract to treat her elsewhere or general contract for treatment until she was cured, there was no obligation on the part of the defendants to follow her to the community to which she moved. One of the defenses interposed by the defendants was that the contract of employment was special and limited to the treatment of the patient in the office of the defendants. There was, the court said, considerable evidence admitted in support of this defense, and the defendants were entitled to proper instructions on this phase of the case.

It is well settled in California, continued the court, that physicians are required only, in treating a patient, to possess and use the ordinary training, skill and care of other ordinarily prudent, careful and skillful physicians practicing in the same or similar communities. It is equally well settled that the standards of practice in a community can be established only by the testimony of experts. No physician, other than the defendants, who was familiar with the standards of practice in the community in which the treatment was given testified in this case, and the defendants were not interrogated on this subject. The plaintiffs produced two physicians as witnesses who had never practiced in that community and knew nothing of the standards of practice there. Neither did they know that the two communities involved in this case were similar or had similar standards of practice. Over the objections of the defendants they were permitted to testify as to the standards of practice in the community to which the patient moved. They were not able to testify that the same standards prevailed in the defendants' community. It was clear to the court that this evidence was incompetent for any purpose. It should not have been received, for it did not prove that the defendants failed to use due care in treating the patient. Without proof of the lack of such due care, the plaintiffs made out no case.

The court could find no error in the record and therefore affirmed the judgment for the defendants. —*McNamara v. Emmons*, 97 P. (2d) 503 (Calif., 1939).

## Society Proceedings

### COMING MEETINGS

- American Association on Mental Deficiency, Salt Lake City, June 20-24. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.
- American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.
- Maine Medical Association, York Harbor, June 22-24. Dr. Frederick R. Carter, 22 Arsenal St., Portland, Secretary.
- Montana Medical Association of, Great Falls, June 24-26. Dr. Thomas F. Walker, 206 Medical Arts Bldg., Great Falls, Secretary.
- Pacific Northwest Medical Association, Spokane, Wash., June 25-28. Dr. C. W. Countryman, 407 Riverside Ave., Spokane, Wash., Secretary.

## Current Medical Literature

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## AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

American Journal of Diseases of Children, Chicago  
61:427-668 (March) 1941

- \*Epidemic Diarrhea of Newborn: I. Clinicoepidemic, Pathologic and Therapeutic Aspects. G. M. Lyon and T. G. Folsom, Huntington, W. Va.—p. 427.
- Granulocytopenia: Report of Three Cases in Which Condition Was Due to Infection and in Which Chemotherapy Was Employed. P. S. Strong, New York.—p. 445.
- Enlargement of Thyroid Gland in Juvenile Patients with Diabetes Mellitus: Incidence of Diabetes and Thyroid Disease in the Family. M. M. Steiner and A. L. Newcomb, Chicago.—p. 458.
- Development of Center for Cuboid Bone in Newborn Infants: Roentgenographic Study. A. U. Christie, San Francisco; Ethel C. Dunham and Rachel M. Jess, Washington, D. C., and A. L. Dippel, Minneapolis.—p. 471.
- \*Encephalitis Complicating Measles: Report on 241 Cases Collected from Literature and Forty-Four Additional Cases. P. M. Hamilton, San Marino, Calif., and R. J. Hanna, Los Angeles.—p. 483.
- Relation of Dental Caries in City Children. H. H. Gordon, S. Z. Levine, B. R. East, New York.—p. 494.
- Attempts to Sensitize Monkeys to Scarlet Fever Antitoxin. J. A. Toomey, W. P. Garver and W. S. Takacs, Cleveland.—p. 518.
- Respiratory Metabolism in Infancy and in Childhood: XXIV. Daily Water Exchange of Premature Infants. H. H. Gordon, S. Z. Levine, H. McNamara, E. Marples and H. R. Benjamin, New York.—p. 524.
- Primary Tuberculous Infections in Young Adult Life and in Childhood, with Reference to Their Relative Advantages and Disadvantages. A. Wallgren, Göteborg, Sweden.—p. 577.
- Osteitis Fibrosa Cystica (Albright). J. L. Neller, Eau Claire, Wis.—p. 590.

**Epidemic Diarrhea of Newborn.**—Lyon and Folsom discuss the epidemic of diarrhea of the newborn which occurred during August 1938 in the nursery of a general hospital, the third since its opening in 1924. The December 1926 and October 1934 epidemics were carefully studied for the usual dysentery bacilli, but none were isolated. The 1938 epidemic appeared similar in every respect to the first two, except that more infants were involved and that it was more severe. The authors believe that there is a difference between bacillary dysentery of the newborn and the diarrhea of the three epidemics. The term "epidemic diarrhea of the newborn" as used by them connotes the same clinical and epidemiologic picture of the highly fatal diarrhea of the newborn described by Rice, Best, Frant and Abramson. After the sudden death of the first infant, successive cases occurred, so that of the 21 newborn possibly exposed, only 6 escaped. Of these 2 left the hospital soon after the epidemic began, and 2 born after isolation measures were instituted were kept away from the nursery and not of the voluminous watery type which rapidly dehydrates the infants had diarrhea (frequent, small, thin stools). While few loose stools were watery, but thereafter they were consistently small in amount, although their number ranged from ten to thirty a day. After the first twenty-four to forty-eight hours they were generally small spots of mucus with some yellowish or greenish discoloration. In most of the infants a distinct redness, with injection, of the mucous membranes of the oropharynx and of the conjunctivas was observed. Only the first infant had any purulent discharge from the nose or throat. After twenty-four to forty-eight hours of moderate and not excessively dehydrating looseness of the stool the more severely affected infants became suddenly and acutely prostrated, had high temperatures (103 F. or higher) and lost from 8 to 12 ounces (227 to 340 Gm.) in weight. The symptoms were not primarily of respiratory or intestinal difficulties but of intracranial involvement. Postmortem examination of 3 of the next 8 newborn infants to become acutely ill revealed severe

generalized edema of the brain. This was undoubtedly the most important pathologic observation. The entire brain appeared to have been affected by a severe toxin or by an active neurotropic virus. A tendency to pinpoint hemorrhage was observed in the brain and most of the other organs, especially of central nervous system tissue. The mucosa of the large and small intestine of 2 infants was markedly denuded. There were no membranes or mucous casts; the appearance of the mucosa of 1 infant suggested a catarrhal infection. The atony of the intestine was remarkable. The mesenteric glands were moderately enlarged and hyperplastic. There were numerous minute hemorrhages beneath the mucosa. Microscopically there was no cellular infiltration of the mucosa or serosa. There was no evidence of bacterial life or invasion. Cultures for the usual pathogenic enteric organisms were negative. Of 16 infants attacked, 5 died. Of the 11 who recovered, the illness of 5 was severe, of 2 moderately severe and of 4 mild. There was an unusual prevalence of clinical influenzal infections within the community during all three epidemics. That the malady is an expression of infection with influenza virus in the newborn is suggested but not proved. Citrated whole blood from a patient recently convalescent from influenza seemed to be beneficial to 3 of the most severely ill infants. Normal adult blood given to 3 patients had no such effect. Clinical observations suggest that a mother may be infected by her own ill infant and that her response to the infection may be a clinical influenza. Whatever the infective agent, its rapid passage through the physiologically and immunologically immature newborn infant makes it likely that an infective agent relatively common among the general population may be so enhanced in virulence as to produce "epidemic diarrhea of the newborn." Such cases may occur individually and go unrecognized because of their distracting symptoms. The authors suggest that the disease is not new and that previously it was probably confused with true primary infection of the gastrointestinal tract. Since the preparation of the article, Lyon has encountered 2 newborn infants, delivered in relatively remote rural homes, who died of what appeared to be the same clinical picture of diarrhea, fever and symptoms referable to the central nervous system.

**Encephalitis Complicating Measles.**—Hamilton and Hanna correlate data from 241 cases of encephalitis complicating measles that have been reported by 110 workers and the 44 additional cases observed by them. Either the incidence of the complication is increasing or the disease is more generally recognized. Its pathogenesis is not known. The severity of the infection, the season, the age, the sex, the race or body type of the patient, the season and other factors appear to have no bearing. The pathologic changes are mostly of vascular origin. Hyperemia, engorgement and hemorrhage are seen in the meninges, the spinal cord or the brain; the hemorrhages are usually petechial, the blood vessels have thickened walls and the peripheral regions show, by special staining techniques, the proliferated cells to be largely microglial cells. The age incidence parallels that of measles; more than one half of the cases precede the measles rash, occur with it or appear at varying periods after it. In the authors' cases it always appeared after (average two and seven-tenths days) the rash save in 1 instance, in which symptoms began five days before the rash. Onset prior to the rash is not usual; it occurred in 16 of the previously reported cases. Symptoms vary according to the severity of the involvement and the portion of the nervous system attacked. The sensorium and cranial peripheral, visceral and sensory nerves can be affected. Fever is usual though not invariably. The cranial nerves are more commonly affected than the peripheral nerves. Signs of meningeal irritation are common. The most common single sign is stiffness of the neck, and next in frequency is Kernig's sign. Laboratory data differ widely. The prognosis of any individual case is uncertain, as the disease may progress, regress or remain stationary. Hyperpyrexia of rapid onset with constant increase was present in about half of the fatal cases; progressive bulbar paralysis was also a serious symptom. Very young patients seem to have the poorer prognosis; otherwise the age incidence of mortality closely parallels that of the disease. The prognosis for sequelae is also uncer-

tain. Any of the neurologic symptoms may become permanent or may persist for a long time before recovery ensues. Residual symptoms do not seem especially likely in patients with a severe acute phase of the illness. Severe paralysis or paresis tends to remain in about 10 per cent and convulsive states and choreiform or athetoid movements in about 5 per cent of the patients. In general, of 10 patients 4 will recover completely, 2 will die and 4 will have one or more major or minor debilitating residual symptoms. Therapy other than symptomatic is variable and unsatisfactory. The authors have had some encouraging results with shock treatment. Of 16 patients treated 3 recovered completely within seventy-two hours, 2 recovered within one week, 1 in two weeks, 1 in three weeks, 2 in from four to six weeks, 4 could not be followed satisfactorily, 2 recovered with residual symptoms and 1 died. Of 18 patients given symptomatic treatment 3 made rapid, uneventful recoveries within seventy-two hours with no residual symptoms, 4 attained complete recovery in one week, 1 in two weeks, 2 in more than two weeks, 1 left the hospital against advice with no improvement at the end of a week, 2 left the hospital with paresis of the extremities and 5 died. The remaining 10 patients received one or more of the following: convalescent measles serum, human convalescent poliomyelitis serum and immunotransfusion; 4 of them recovered without residual symptoms in one week, 1 recovered completely in six weeks and 5 died. There were 47 deaths among the 241 cases collected from the literature.

### American J. Digestive Diseases, Huntington, Ind.

8:65-100 (March) 1941

- Carcinoma of Head of Pancreas: Review of Forty Cases. S. C. Franco, Brooklyn.—p. 65.  
Gastric Diverticula. N. E. Reich, Brooklyn.—p. 70.  
Study of Movements of Duodenum, with Special Reference to Antiperistalsis. P. M. McCray Jr., Rochester, Minn.—p. 76.  
Studies on Secretion of Acid Following Procedures on Distal End of Stomach. J. H. Grindlay, Rochester, Minn.—p. 82.  
Role of Small Intestine During Emesis. M. J. Oppenheimer, Philadelphia, and F. C. Mann, Rochester, Minn.—p. 86.  
Influence of Cathartics on Activity of Small Intestine. M. J. Oppenheimer, Philadelphia, and F. C. Mann, Rochester, Minn.—p. 90.

### American Journal of Medical Sciences, Philadelphia

201:313-468 (March) 1941

- Observations on Clinical and Functional Course of Nephrotoxic Nephritis in Dogs. P. J. Fouts, A. C. Corcoran and I. H. Page, Indianapolis.—p. 313.  
Influence of Liver Damage on Plasma Prothrombin Concentration and Response to Vitamin K. S. P. Lucia and P. M. Aggeler, San Francisco.—p. 326.  
Some Bacteriologic Observations on Pneumonia. M. M. Bracken, Pittsburgh.—p. 340.  
\*Vitamin E in Treatment of Fibrositis. C. L. Steinberg, Rochester, N. Y.—p. 347.  
QRS Complex in Precordial Leads in Anterior Wall Infarction: True and False Infarction Curves. V. Mortensen, Copenhagen, Denmark.—p. 349.  
Absorption, Excretion and Distribution of Sulfadiazine (2-Sulfanilamidopyrimidine). O. L. Peterson, E. Strauss, F. H. L. Taylor and M. Finland, Boston.—p. 357.  
Comparison of Mortality in Pneumococcal Pneumonia Treated by Hydroxyethylapocrepine and by Sulfapyridine. W. W. G. MacIsaac, J. M. Johnston, M. M. Bracken and L. S. Pierce, Pittsburgh.—p. 367.  
Use of Syntropan in Parkinsonism. N. S. Schlezinger and B. J. Alpers, Philadelphia.—p. 374.  
Pellagra and Porphyrinuria. R. Kark and A. P. Meiklejohn, Boston.—p. 380.  
Renal Function in Late Toxemia of Pregnancy. A. C. Corcoran and I. H. Page, Indianapolis.—p. 385.  
Action of Paredrinol After Induction of Hemorrhage and Circulatory Collapse. E. A. Stead Jr. and R. V. Ebert, Boston.—p. 396.  
\*Clinical Importance of Small Intracutaneous Veins in Human Chest. J. B. Burrett and D. Scherf, New York.—p. 399.  
Leukopenia in Negro Workmen. W. H. Forbes, R. E. Johnson and F. Consolazio, Boston.—p. 407.  
Mural Thrombi in Heart as Source of Emboli. C. F. Garvin, Cleveland.—p. 412.  
Apoplexy Apparently Precipitated by Low Blood Pressure. A. D. Ecker and M. Deren, Syracuse, N. Y.—p. 415.

**Vitamin E in Treatment of Fibrositis.**—Steinberg gave from 2 to 8 cc. of wheat germ oil daily to 82 patients with various disorders. Thirty patients with primary fibrositis were treated with vitamin E in doses of from 2 to 8 cc. daily and all were completely relieved of symptoms. Two of this group

obtained only mild relief after taking 3 cc. of wheat germ daily for four weeks. They were then given a vitamin E molecular distillate containing 120 mg. of naturally occurring alpha-tocopherol daily, and after one week of such therapy they were completely relieved. Of 20 patients with atrophic arthritis with secondary fibrositis given from 2 to 8 cc. of wheat germ daily for from two to four months, 8 noticed definite improvement in muscle soreness and stiffness and 12 experienced no relief. Twenty patients with hypertrophic arthritis with secondary fibrositis were given from 2 to 6 cc. of wheat germ daily for from two to six months and none noticed improvement in the soft tissue structures. Of the 12 remaining patients, 1 with gout was given 4 cc. of wheat germ daily for four weeks without relief from the extreme muscle soreness, 3 with sciatica of unknown cause were given 4 cc. for four weeks without relief and 8 with "psychosomatic rheumatism" received wheat germ oil for from two to three months without relief. These were all later relieved by barbiturate or bromide therapy. The studies tend to indicate that primary fibrositis may be a metabolic rather than an infectious process.

**Small Intracutaneous Veins in Chest.**—In examining 385 patients for the presence of ectasia of small intracutaneous veins in the region of the pleural sinuses, Burrett and Scherf found that they are not the result of pulmonary, pleural or cardiac disease. They are found in healthy people and their incidence increases with age. The 385 patients represented miscellaneous clinical material and were unselected, but the group intentionally included many instances of pulmonary and cardiac disease because of the supposed relationship of such veins to these conditions. Ectasia of only intracutaneous veins, more or less dendritically arranged, at the level of the pleural sinuses or round the last cervical and first to fifth dorsal vertebral spines was looked for. Such veins were present in 261 (67.7 per cent) of the 385 patients examined. Their incidence definitely increased among older subjects. Among 29 patients less than 20 years of age the veins were present in 14 (48.2 per cent), while they were observed in 46 (76.6 per cent) of 60 subjects 60 or more years of age. These veins were present in only 28 (51.8 per cent) of 54 patients with pulmonary disease (tuberculosis, emphysema and bronchitis). Among 94 decompensated cardiac patients examined (coronary sclerosis, rheumatic heart disease, syphilitic aortitis and hypertension) the veins were detected in 66 (70.2 per cent). Of 35 patients with visible pleural adhesions on fluoroscopic examination 10 (20.8 per cent) failed to exhibit superficial chest veins, in 6 the veins were present only on the side opposite to the adhesions and in 5 they were more prominent on the side of the adhesions. Among 137 patients with diabetes, peptic ulcer and other diseases but without demonstrable pulmonary or cardiac disease the veins were detected in 95. Among 261 positive cases, they were bilateral in the region of the phrenicocostal sinus in 103 (39.5 per cent). The study shows that the phlebectases follow the borders of the pleural sinuses, are more definitely in evidence at the lower anterior pulmonary margin and are most common on the left side. In 155 of 246 patients displaying veins anteriorly, fluoroscopic study revealed that these structures were located exactly at the attachment of the diaphragm. There was no relation to this muscle in 5. Whenever the veins were above or below the contact area, a definite reason for the exception was found. For example, they were above in patients whose diaphragms were low or horizontal (enteroptosis, pulmonary emphysema) and below when the skin had been stretched by large pendulous breasts or a recent marked reduction of weight had occurred. The author offers the following explanation for the developmental mechanism of these veins. Any sudden physical exertion such as running up a flight of stairs, cough, pressure during defecation, even bending, causes increased intrathoracic pressure. The transmission of this increased pressure may be prevented in some areas by venous valves. The fact that these veins are more or less limited to the borders of the pleural sinuses may be due to a special arrangement of the veins and their communication with the superficial vessels at these locations. The available knowledge concerning intrathoracic pres-

tures at different areas under normal and abnormal conditions is meager. The fact that bullae in advanced emphysema usually occur at the apexes, the anterior margin of the lung and at the bases, that is, at the same sites at which the "pleural sinus veins" appear, may be the result of a special elevation of pressure in these areas during cough or pressure. The author believes that knowledge of the existence of these structures, their high incidence and their exact location may have some importance, as they readily indicate the site of the pleural sinuses; this may aid in the differential diagnosis of some intrathoracic diseases.

### American J. Orthodontics and Oral Surgery, St. Louis

27:125-168 Orthodontics (March) 1941

125-168 Oral Surgery

#### Orthodontics

Southwestern Society of Orthodontists. G. C. Turner, Lubbock, Texas.—p. 125.

Some Metallurgic Aspects of Orthodontic Materials. A. S. Rose, Buffalo.—p. 127.

Coordination of Otolaryngology and Orthodontics. F. B. Malone, Lubbock, Texas.—p. 142.

Dental Preparation of Aspirants to the United States Military Academy. W. H. Day, Washington, D. C.—p. 147.

Easy and Inexpensive Method of Making Hawley Retainers. W. B. Stevenson, Amarillo, Texas.—p. 154.

#### Oral Surgery

Lesions of Oral Mucosa Treated with Specific Vitamins. D. Weisberger, Boston.—p. 125.

Lymphangiomas of Tongue. J. P. Rigg and R. Waldapfel, Grand Junction, Colo.—p. 128.

Elimination of Pyorrheal Pocket by Electrosurgery. W. I. Ogus, Washington, D. C.—p. 135.

The Future of the Pulpless Tooth. L. I. Grossman, Philadelphia.—p. 145.

\*Relationship of Arthritis to Oral Diagnosis, Defocalization and Streptococcus Vaccine Therapy. M. Shuster, New York.—p. 149.

**Relationship of Arthritis to Oral Infection.**—Shuster points out that in recent years the focal infection theory of chronic arthritis has been the target of much criticism. The results of defocalization have not always lived up to expectation, and some workers do not advise dependence on this treatment in such joint conditions. The author believes this view is based on a misconception of the theory. That such treatment deserves an important place in the therapy of chronic infectious arthritis is shown by his results obtained in 785 patients treated by defocalization. Of 468 persons with arthritis for less than six months the teeth of 366 were removed and 150 of these were improved, the tonsils of 78 were removed and 39 were improved, and of the 24 patients who had sinus surgery 3 improved. Of the 317 remaining patients with arthritis for more than two years 43 of 215 were improved following the removal of teeth, 21 of 84 after tonsillectomies and 1 of 18 after their sinuses were drained. These figures indicate the advantage of early focal surgery. The removal of foci in the early cases was approximately twice as effective as in the late stages of the disease. Some of the reasons which may be responsible for the failure of focal surgery are: 1. Not every infected tooth or tonsil is the cause of the focal infection. 2. Secondary foci may be present if the focal infection is of long duration. Thus even if the primary focus is removed infection may still be present in inaccessible areas. Remembering the frequency of secondary foci of infection the surgeon should, if possible, prepare a vaccine from the enucleated focus. 3. Not infrequently the infected focus is incompletely removed and focal infection continues. When teeth or tonsils are removed, fragments and surrounding infected areas may be left. 4. If the removal of infected foci is postponed too long it can scarcely be expected to effect improvement in terminal stages of the disease. 5. Surgery may activate a walled-off focus, and such incidental trauma may promote the development of secondary foci. The spectacular instances of recovery after focal surgery may blind one to the fact that not all patients are benefited and that some are even harmed. It is not fully realized that trauma to an infected focus may result in dissemination of its bacterial products. Even irritation of a focus may cause a systemic invasion. Bacteremia is often seen after defocalization. Septicemia and subacute bacterial endocarditis occur too frequently to be dis-

regarded. Subacute bacterial endocarditis after defocalization in patients with a history of rheumatic heart disease must always be kept in mind. In spite of such complications the author still believes that except in cases of rheumatic heart disease foci should be removed as early as is compatible with safety. In chronic infectious arthritis surgery should always be delayed in leukopenia, pronounced shift to the left of leukocytes, absence of blood complement and in an acutely infected focus. A short course of streptococcus vaccine reduces the incidence of exacerbations after defocalization. The statement that streptococcus vaccine has failed in the treatment of chronic infectious arthritis should not be accepted before some of the reasons for failure are analyzed. 1. Vaccines are often prepared from noninfecting or nonetiologic foci. 2. The autogenous vaccine prepared often consists only of the predominant strain, and such a strain may be nonpathogenic. 3. Stock streptococcus vaccines have often been employed. Most bacteriologists agree that stock vaccines are no better than non-specific therapy. 4. Vaccine therapy is sometimes begun too late in the stage of the arthritis when the symptoms are not due to infection but to articular derangement. 5. Dependence should not be placed on vaccine therapy alone; orthopedics, physical therapy, massage and corrective exercises are indicated. 6. Vaccine therapy is often discontinued too soon. 7. Improper dosage is often responsible for poor results. Experience has shown that small doses are effective. The author has used streptococcus vaccine for chronic arthritis for the last sixteen years. It should not be used to the exclusion of other recognized measures, but he feels that even if vaccine therapy does not cure arthritis it at least checks the infection. However, unless infected foci are removed reinfection will frequently occur.

### American Review of Tuberculosis, New York

43:319-448 (March) 1941

\*Oleothorax: New Evaluation with Review of 101 Cases. R. H. Browning, C. C. Dundon and E. S. Ray, Warrensville, Ohio.—p. 319.

Respiratory Reserve Before and After Thoracoplasty. G. F. Piltz, T. De Cecco, W. Chapman and B. P. Potter, Jersey City, N. J.—p. 338.

Tuberculosis in the Jewish Diabetic. A. Rest, Spivak, Colo.—p. 344.

Decline in Mortality from Respiratory Tuberculosis Among Young Adults. G. P. Wright and P. D. Hart, London, England.—p. 357.

Sanatorium in the New Jersey Tuberculosis Program: Ten Year Review. E. Frankel, Trenton, N. J.—p. 364.

Tuberculosis in Mental Hospitals. M. Pollak, Peoria, Ill.; A. V. Hummel and I. L. Turow, Bartonville, Ill.—p. 373.

Preventorium and Reinfection Type Tuberculosis. E. Friedman and Bernice W. Billings, Boston.—p. 383.

\*Tuberculosis of Tonsils: Its Relation in Children with Tubercle Bacilli in Gastric Contents. E. Rosenerantz and S. Hurwitz, San Francisco.—p. 388.

Treatment with Solganal B Oleosum: Contribution to Question of Gold Therapy. F. Seligson, Glenduff, N. H.—p. 394.

Vitamin C in Experimental Tuberculosis. M. M. Steinbach and S. J. Klein, New York.—p. 403.

Effect of Vitamin C on Experimental Tuberculosis in Rabbit. M. M. Steinbach, S. J. Klein and C. J. Duen, New York.—p. 415.

Human Tuberculosis in a Bovine: Case Report of Spontaneous Infection in an Adult Bovine. W. H. Feldman and H. Moses, Rochester, Minn.—p. 418.

**Oleothorax.**—Browning and his associates review 101 consecutive cases of oleothorax instituted at Sunny Acres Sanatorium for disinfection (tuberculous empyema) or inhibition (obliterative pleurisy) purposes between December 1931 and July 1939. Since the induction of oleothorax the patients have been cared for in sanatoriums, outpatient clinics or by private physicians. Recent reports on their condition and work capacity have been obtained from all but 11 patients; 9 died and 2 could not be located. In the 48 empyema cases oleothorax was never induced when the patient was acutely ill or toxicemic, and all but 1 had reached a relatively afebrile stage before the instillation of oil was begun. All persons studied had had oleothorax for at least six months, and the longest period of treatment was more than eighty-four months. Success was attained within a period of twelve months in 36 (75 per cent) of the 48 patients; the result in the remaining 12 patients was considered a failure because of persistent purulent fluid. In addition to the surprisingly prompt cessation of fluid formation in many cases, improvement in the patients' general condition was a prominent feature. In the successful cases, low grade fevers disappeared, malaise was less, appetites improved and weight gains were common. Of the original successes 33



patients still had a satisfactory oleothorax result at the time of this study. The work capacity of 18 of these patients\* is either full or part time. Among the 53 patients with oblitative pleurisy 44 had had gross, serous effusion during pneumothorax therapy and 24 were still forming fluid when oleothorax was induced. As in the empyema group, all the patients had been treated with oleothorax for at least six months when the study was made. The treatment was successful in 46 of the group during the first six months and in 1 at eighteen months. Of the failures, 3 formed purulent fluid persistently, bronchopleural fistula developed in 2 and a pleurocutaneous fistula in 1. At the end of the study complications developed in 5; therefore the final tabulation shows 42 successes. The average duration of oleothorax in the successful group was thirty months, and 15 of these patients are doing full time work. Seven of these 15 have had oleothorax for more than five years. Ten patients are able to work part time, 11 are unable to work, 3 are still under treatment, 2 are dead and 1 could not be traced. A further study of the 26 patients in whom oleothorax was not successful shows that there is a definite correlation between positive sputum and the results of oleothorax treatment. In only 7 of 15 with a positive sputum was oleothorax successful as contrasted with 67 of 85 patients with negative sputums. An additional group of 21 patients with extrapleural pneumothorax had oleothorax for from five to fifteen months, with an average of ten and one half months. Serous or purulent fluid was forming in 13 when oleothorax was started. After one month, fluid formation had stopped in all but 4, and at the time of the study pus continued to form in only 1 after fourteen months of oil blockade. The results are satisfactory in 17 of the 21 patients, 1 patient died from other causes although oleothorax was successful, the lung of 1 reexpanded and the pocket was lost, a bronchopleural fistula developed in 1 after one month and a thoracoplasty is being done, and 1 patient had a persistent cavity because of insufficient collapse and left the hospital without approval after three months of oleothorax.

**Tuberculosis of Tonsils.**—Rosencrantz and Hurwitz determined the frequency of positive gastric contents associated with tuberculous tonsils. The material for their study consists of 103 female children from 8 months to 13 years of age admitted to the University of California Tuberculosis Service during the last five years. In each case the Mantoux test with 0.1 mg. of old tuberculin was positive. The gastric contents of each child were injected into a guinea pig. A roentgenogram was taken of each child. Many patients had hypertrophic tonsillitis and, when the general condition improved, tonsillectomy and adenectomy were done as indicated. The adenotonsillar tissue was studied microscopically. The pathologic lesions were either unilateral or bilateral and the tubercle formation was either discrete or confluent. Giant cell formation was common, but caseation was not a special feature. The surface epithelium of the tonsil was invariably intact. Tubercle bacilli were rarely demonstrated. In one case the adenoid tissue alone showed tuberculous involvement. There were 19 patients with tuberculosis of the tonsils. Their ages ranged from 16 months to 12 years. Clinical pulmonary tuberculosis was diagnosed in 8 patients and corroborated by roentgen study; hilar lymph node enlargement occurred in 9 patients and pleural effusion in 2. Cervical lymphadenitis was associated twice with hilar nodes, and in 1 of the latter patients an additional complication was bone tuberculosis. Of the 19 patients with tuberculous tonsils 18 had positive gastric contents as shown by guinea pig inoculation. The recovery following tonsillectomy was normal in every instance. The operation was deferred until the pulmonary lesion was quiescent and until the physical condition of the patient was generally improved. The tuberculous lesion in the tonsils was latent, and the indications for tonsillectomy were the same as in the nontuberculous child. The authors believe that removal of tuberculous tonsils will reduce absorption from tuberculous foci and perhaps offer a prophylactic measure against the development of tuberculous cervical adenitis. They suggest that children who harbor the organisms in the stomach have unconsciously coughed up and then swallowed the sputum. The mechanism of tonsillar infection remains unproved, in agreement with Long and his co-workers that probably all patients with pulmonary tuberculosis have tuberculous tonsils.

## Annals of Internal Medicine, Lancaster, Pa.

14:1499-1740 (March) 1941

- Clinical Manifestations of Nicotinic Acid and Riboflavin Deficiency (Pellagra). V. P. Sydenstricker, Augusta, Ga.—p. 1499.  
Fundamental Principles in Adjustment Reactions of Organism to Anoxia. E. Gellhorn, Chicago.—p. 1518.  
\*Hemolytic Streptococcus Pneumonia and Empyema: Study of Fifty-Five Cases with Special Reference to Treatment. C. S. Keefer, Boston; L. A. Rantz, San Francisco, and C. H. Rammelkamp, Boston.—p. 1533.  
Cerebral Manifestations of Bacterial Endocarditis. E. C. Toone Jr., Richmond, Va.—p. 1551.  
Tuberculosis Among Students and Graduates of Medicine. J. A. Myers, H. S. Diehl, Ruth E. Boynton, Minneapolis; P. T. Y. Chi'u, Peiping, China; T. L. Streukens and B. Trach, Minneapolis.—p. 1575.  
\*Intravenous Use of Sodium Sulfapyridine in Treatment of Lobar Pneumonia. C. W. Strickler Jr., A. P. McGinty and J. B. Peschau Jr., Atlanta, Ga.—p. 1595.  
Phonocardiography and Its Clinical Correlation. H. Arenberg, New York.—p. 1607.  
Problems of Acute Infections. J. H. Musser, New Orleans.—p. 1617.  
Problem of Rheumatism and Arthritis: Review of American and English Literature for 1939 (Seventh Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz.; J. A. Key, St. Louis, and C. McEwen, New York.—p. 1631.

**Hemolytic Streptococcus Pneumonia and Empyema.**—Keefer and his associates analyzed 55 cases of hemolytic streptococcus pneumonia (39) and empyema (16) with regard to prognosis and treatment. Fourteen of the empyema cases followed pulmonary infection. The cases of pneumonia were primary, followed respiratory infection or were superimposed on a preexisting chronic pulmonary infection. The fatality rate in the 39 cases of pneumonia was 17 per cent. The unfavorable prognostic factors were age (i. e. more than 50 years of age), bacteremia and debilitating disease. The fatality rate for the patients with empyema was 18 per cent; there was only 1 death from empyema between the ages of 10 and 40 years. Bacteremia was present in 12 per cent of cases and it was more common in patients more than 50 years of age. The fatality rate in bacteremic cases was 57 per cent, whereas in the nonbacteremic cases it was only 7 per cent. Sulfanilamide or sulfapyridine did not reduce the incidence of empyema nor did it seem to shorten the course of the disease. There was suggestive evidence that the fatality rate among both the pneumonia and the empyema cases was reduced by using these drugs. Four patients with empyema recovered following multiple aspirations of the chest and chemotherapy. The best results were obtained with chemotherapy and thoracotomy.

**Intravenous Sulfapyridine Sodium for Lobar Pneumonia.**—Strickler and his co-workers report on the use of sodium sulfapyridine monohydrate intravenously in the treatment of 54 patients with lobar pneumonia. These patients were admitted to the Grady Memorial Hospital between Dec. 15, 1939 and March 16, 1940. The diagnosis was made from history, physical signs, laboratory studies, serial roentgenograms and postmortem observations. The routine dose of sulfapyridine sodium was 0.06 Gm. per kilogram of body weight repeated every six hours until the temperature became normal. The drug was dissolved in 750 cc. of physiologic solution of sodium chloride or in 5 per cent dextrose solution. The saline solution was used when vomiting occurred, otherwise dextrose solution was used. After the temperature dropped to normal, the same dose was given every eight hours for forty-eight hours and then every twelve hours for forty-eight hours, when the intravenous administration was discontinued and 1 or 0.5 Gm. of sulfapyridine was given orally every four hours. An equal amount of sodium bicarbonate was given by mouth with each dose of the two drugs. If the patient's response seemed unsatisfactory forty-eight hours after parenteral treatment was begun, type specific antiserum was administered. Thirty-two of the 54 patients were males and 22 females. Their ages varied from 13 to 84 years. The average age was 38 years, of the survivors 34 years and of the patients who died 64 years. The average number of days elapsing between the onset of the pneumonia and admission to the hospital was two and eighty-four one hundredths days, for the survivors two and eighty-two one hundredths days, and for the patients who died three days. There were 8 deaths, or a 14.8 per cent mortality. Of the 54 patients, 6 had a normal temperature within twenty-four hours

after the drug was first administered, 16 were afebrile within thirty-six hours, 10 within forty-eight hours and 5 within seventy-two hours. Of the 46 patients who recovered, 9 required more than seventy-two hours to reach the afebrile state. There was a spread of the pneumonic process in 1 of the patients who died and in 2 survivors. In the first the spread occurred after the drug had been discontinued because of tonic and clonic convulsions. The initial response of the infection was typical with crisis. Death was considered to be due to the toxic reaction from the drug. The first surviving patient had had an initial crisis within thirty-six hours and had been receiving 1 Gm. of sulfapyridine by mouth every four hours for six days. On the eleventh hospital day, while the free sulfapyridine in the blood was 3.3 mg. per hundred cubic centimeters, the pneumonia spread. Sulfapyridine sodium was again injected, but this time the response was by lysis. The other surviving patient was apparently well when sulfapyridine sodium was stopped on the tenth hospital day. The free sulfapyridine content was 2.6 mg. per hundred cubic centimeters of blood before the last injection. Sulfapyridine orally was begun with 0.5 Gm. every four hours. The next day the blood level of free sulfapyridine was too low to read. Pain over the contralateral lung, fever and signs of consolidation developed. Sulfapyridine was increased to 1 Gm. every four hours and the patient recovered by lysis. The drug of 11 surviving patients was discontinued because of hematuria, encephalopathy, rash or hemolytic anemia. Of these 6 recovered without further chemotherapy or specific antiserum. The other 5 were given type specific antiserum the day the drug was stopped or the following day. Antiserum was given to 3 patients while the drug was being continued: to 1 because of a very poor prognosis and to 2 because of leukopenia. The remaining 4 of the 12 patients who received antiserum were among the fatal group. The mortality rate of 14.8 per cent is not lower than that after oral administration of sulfapyridine. Complications of lobar pneumonia were not prevented by the intravenous administration of sulfapyridine sodium, and the toxic reactions were of about the same or of slightly greater frequency than those of patients receiving the drug orally.

### Archives of Neurology and Psychiatry, Chicago

45:403-576 (March) 1941

- Histologic Evidence of Damage to Brain in Monkeys Treated with Metrazol and Insulin. K. H. Finley and C. Brenner, Boston.—p. 403.
- \*Amphetamine Sulfate-Sodium Amytal Treatment of Schizophrenia. E. Davidoff, E. C. Reifenshtein Jr. and G. L. Goodstone, Syracuse, N. Y.—p. 439.
- Sweat Mechanism in Man: Study of Distribution of Sweat Fibers from Sympathetic Ganglions, Spinal Roots, Spinal Cord and Common Carotid Artery. O. R. Hyndman and J. Wolkin, Iowa City.—p. 446.
- Neoplasm of Posterior Fossa Simulating Cerebral Vascular Disease: Report of Five Cases with Reference to Role of Medulla in Production of Arterial Hypertension. B. C. Meyer, Orangeburg, N. Y.—p. 468.
- Metamorphopsia and Other Psychovisual Disturbances in Patient with Tumor of Brain. M. B. Bender and M. G. Kanzer, New York.—p. 481.
- \*Convulsive Seizures in Delirium Tremens. M. Rosenbaum, M. Lewis, P. Piker and D. Goldman, Cincinnati.—p. 486.
- Cysticercosis of Brain: Report of Case with Operation. B. S. Ray, New York.—p. 494.
- Chemistry of Anticonvulsant Drugs. T. J. Putnam, New York, and H. H. Merritt, Boston.—p. 505.
- Differential Diagnosis of Hysterical Tremor. P. Schilder, New York.—p. 517.
- Astrocytosis Arachnoidae Cerebelli: Rare Manifestation of von Recklinghausen's Neurofibromatosis. A. E. Walker, Chicago.—p. 520.
- Danger of Subarachnoid Injection of Alcohol for Relief of Pain. R. A. Groff and F. H. Lewy, Philadelphia.—p. 535.

**Amphetamine Sulfate-Sodium Amytal for Schizophrenia.**—Davidoff and his associates treated 80 patients with catatonic, paranoid, hebephrenic or simple schizophrenia with sodium amytal and amphetamine sulfate. They compare the results of this therapy with that obtained in 500 patients with schizophrenia treated by other routine procedures, 50 patients with dementia praecox treated with sodium amytal alone, 30 patients with dementia praecox treated with amphetamine sulfate alone and 25 patients with manic-depressive psychosis treated by the combined amphetamine-amytal method. Of the 80 patients 29 were discharged to their homes. The psychosis of 51 was of less than two years' duration and 22 of these were discharged. In the remaining 29 the psychosis was of more than two years' duration and of these only 7 were

returned to their homes. The most favorable results were obtained in the group with early catatonia, in which 15 of the 27 patients were discharged. In the group with more prolonged catatonia, improvement was observed in only 1 of 6 patients. Poor results were obtained in the paranoid and the hebephrenic group irrespective of the duration of the disease. Regardless of the length of the psychosis 5 of the 10 patients with simple dementia praecox reacted favorably. Of the 500 schizophrenic patients admitted consecutively from 1931 to 1936 and treated by routine methods only 20.6 per cent were discharged to their homes, as compared with 36 per cent of patients treated with amphetamine and amytal, and likewise 26 per cent of the control patients ill less than two years and 14 per cent ill more than two years as compared with 43 and 24 per cent, respectively, of those receiving combined therapy. The greatest difference was shown among patients with the catatonic type of disorder of less than two years' duration, the percentages being 23 for the control patients and 56 for those receiving the amphetamine-amytal treatment. Of the 50 patients treated with amytal narcosis alone, only 30 per cent were discharged to their homes. Twelve, or 40 per cent, of the 30 catatonic patients receiving amphetamine sulfate therapy alone were discharged to their homes, and of the 25 manic-depressive patients receiving amphetamine sulfate-sodium amytal therapy 13 were returned to their homes.

**Convulsive Seizures in Delirium Tremens.**—Among 305 active cases of delirium tremens there were, according to Rosenbaum and his co-workers, 29 who had convulsions. Except for the convulsion the clinical picture of these patients on admission was similar to that of the patients who had no convulsions. All 29 patients recovered. All but 1 had a history of many years of alcoholism before the onset of convulsions. The average age at onset was 39 years. There was a history of injury to the head in 34 per cent as compared with that of 8 per cent in those with no convulsions. Air encephalograms were made of 7 patients, and evidence of cortical atrophy and ventricular dilatation was obtained in all of them. None of the 29 patients had syphilis of the central nervous system or focal neurologic disease. Successive electroencephalographic tracings of 1 patient after ingestion of whisky revealed abnormal waves which became progressively exaggerated and spread to all parts of the cerebral cortex. However, no convulsions resulted. The finding that 9 per cent of the 305 patients with delirium tremens have convulsions coincides with the statement by Lennox and his associates that 10 per cent of the population has a cerebral dysrhythmia which may represent a predisposition to convulsions. The authors suggest that the following factors may cause convulsions to appear in delirium tremens: (1) a constitutional predisposition to fits, (2) cerebral lesions (injury to the head and alcoholic damage to the brain), (3) acute cerebral lesions and severe metabolic strains resulting from delirium tremens and (4) the exaggerating effect of alcohol on existing abnormalities in the brain waves.

### California and Western Medicine, San Francisco

54:101-152 (March) 1941

- Evaluation of Newer Therapy in Pneumonias. R. E. Thomas, Los Angeles.—p. 106.
- Surgical Treatment of Essential Hypertension. W. Crane, Oakland.—p. 108.
- Changing Treatment in Acute Infections. P. M. Hamilton, San Marino.—p. 111.
- Poison Oak and Poison Ivy Immunity Studies in Guinea Pigs. E. K. Stratton, San Francisco.—p. 115.
- Pentobarbital Sodium, Nembutal, in Obstetric Analgesia. Gwendolyn Campion, San Francisco.—p. 116.
- Pediatrics: Its Broader Aspects. O. Reiss, Los Angeles.—p. 119.
- \*Epidermophytosis Treated with Sodium Borate. A. E. Ingels, San Francisco.—p. 120.
- Premature Obstetric Delivery Due to Poliomyelitis, with Respiratory Paralysis Complication. N. M. Spishakoff, D. Golenternek, Los Angeles, and A. G. Bower, Glendale.—p. 121.

**Epidermophytosis Treated with Sodium Borate.**—Ingels used sodium borate in powder form and soaks for the treatment of 202 cases of epidermophytosis of the feet, groins, axilla, anus and body. The powder was made up with 20 per cent aluminum silicate (kaolin) and 10 per cent magnesium carbonate for hygroscopic effect and also in a talcum base.

The soaks were administered in the form of 2 per cent foot or sitz baths. In a few cases of epidermophytosis of the trunk, sodium borate was used in an average of 1 cup to a tubful of water, with soaks once a day for ten minutes. The time for cure varied with the various sites, depending on moisture, friction and other mechanical factors. The dry, scaly type with the vesicular element responded best. Of the 202 patients with the typical dry or average vesicular involvement 138 were believed cured after an average healing time of seventeen days for those with uncomplicated foot involvement; 64 patients were greatly improved when last seen but did not return for a check-up. The average healing time for the groin, anal region and axilla were much longer. None of the patients showed dermatitis venenata, and no irritation was encountered. Generally the patients stated a beneficial effect on their itching symptoms. The raw, weeping and denuded type has not been included in the series. In such cases the method should be applied with extreme caution and only by an experienced dermatologist.

### Cancer Research, Philadelphia

1:95-180 (Feb.) 1941. Partial Index

- Some Effects of Carcinogenic Agents on Mice Subject to Spontaneous Leukoses. J. J. Morton and G. B. Mider, Rochester, N. Y.—p. 95.  
Effect of Nursing on Incidence of Spontaneous Leukemia and Tumors in Mice. W. A. Barnes, New York, and R. K. Cole, Ithaca, N. Y.—p. 99.  
Changes in Incidence of Mammary Carcinoma in Mice of A Stock. J. J. Bittner, Bar Harbor, Maine.—p. 113.  
Variability of Incidence of Mammary Carcinoma in Inbred Strains of Mice. J. J. Bittner, Bar Harbor, Maine.—p. 115.  
Decline in Incidence of Mammary Cancer in Mice of Inbred Strain. H. Burrows, London, England.—p. 121.  
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Glutamic Acid in Tumor Hydrolyzates. R. G. Mathers, London, England.—p. 146.  
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Cancer in Hainan, China: Supplementary Statistical Study of 451 Cases with Special Reference to Age, Anatomic Distribution and Etiology. N. Bercovitz, Hainan, China.—p. 154.  
Abortifacient Substance in Human Urines. M. Ross and R. I. Dorfman, New Haven, Conn.—p. 158.

### Connecticut State Medical Journal, Hartford

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### Florida Medical Association Journal, Jacksonville

27:425-476 (March) 1941

- Evaluation of Treatment of Cryptorchism. P. R. Kundert and L. M. Orr, Orlando.—p. 437.  
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The Devitalized Tooth: Factor in Ophthalmology. B. H. Palmer, Miami.—p. 448.  
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### Georgia Medical Association Journal, Atlanta

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- Georgia's Obstetric Problems for 1940. J. R. McCord, Atlanta.—p. 81.  
Study of Maternal Mortality and Infant Deaths: Committee Report. H. F. Sharpley Jr., Savannah.—p. 82.  
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### Illinois Medical Journal, Chicago

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- Enteric Intramural Herniation Following Colostomy. G. J. Rukstina, C. B. Thrift and F. M. Sylvester, Chicago.—p. 195.  
Relation of Meckel's Ganglion to Accommodation and Intraocular Tension. W. H. Luedde, St. Louis.—p. 199.  
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Postgraduate Services for County Medical Societies. R. S. Berghoff, Chicago.—p. 210.  
Criteria for Discontinuing Treatment for Syphilis. S. W. Becker, Chicago.—p. 211.  
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Renal Cysts Communicating with Pelvis. J. P. Bennett, Chicago.—p. 232.  
Cerebral Insult Following Hypoglycemic Shock Therapy, with Recovery: Case Report. J. W. Klapman and J. Weinberg, Chicago.—p. 236.  
Extrarenal Azotemia. H. N. Kamin, Chicago.—p. 237.  
Sulfanilamide and Convalescent Serum in Scarlet Fever. A. M. Wolf and S. O. Levinson, Chicago.—p. 239.  
Carcinoma of Bladder with Roentgen Films of Lesions Before and After Extensive Deep Radiation Therapy. G. M. Landau, Chicago.—p. 246.  
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### Journal of Allergy, St. Louis

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- Effect of Vitamin C Deficiency on Smooth Muscle Responsiveness to Nonspecific Stimulation. H. J. Friedman, Cleveland.—p. 221.  
Use of Theophylline with Ethylendiamine (Aminophyllin) for Control of Bronchial Spasm: Pharmacologic Study. R. H. Young, Evanston, Ill., and R. P. Gilbert, Chicago.—p. 235.  
Precipitins in Serums of Patients with Clinical Allergy: Preliminary Report. M. B. Cohen and R. R. Weller, Cleveland.—p. 242.  
Study on Reagin Content of Spinal Fluid. M. London, Cleveland.—p. 244.  
Spontaneous Allergy (Atopy) in Lower Animal: Seasonal Hay Fever (Fall Type) in Dog. F. W. Wittich, Minneapolis.—p. 247.  
Cutaneous and Systemic Reactions Observed During Oral Poison Ivy Therapy. B. Shelmire, Dallas, Texas.—p. 252.  
\*Allergy in Childhood: IV. Does Heredity Determine Age of Onset? B. Ratner, D. E. Silberman and Janet E. Greenburgh, New York.—p. 272.  
Experimental Reproduction of Respiratory Mold Allergy. L. H. Harris, Elyria, Ohio.—p. 279.  
Sensitivity to Gum Acacia: Report of Ten Cases of Asthma in Printers. C. B. Bohner, Indianapolis; J. M. Sheldon and J. W. Trenis, Ann Arbor, Mich.—p. 290.  
Generalized Allergic Reactions to Insulin: Review of Literature, with Report of Case. E. Yasuna, Boston.—p. 295.  
Atmospheric Allergens in Alaska. O. C. Durham, North Chicago, Ill.—p. 307.

**Allergy, Heredity and Age of Onset.**—Ratner and his colleagues determined the presence or absence of a hereditary taint in 250 allergic children from 1 to 10 years of age. The period of maximal liability was the first five years of life. In the first year there was a slightly greater number (56 per cent) of cases occurring in the group with a taint on both sides (bilateral), and the group with no hereditary taint (negative) was slightly larger (48 per cent) than the group with a one-sided taint (46 per cent), that is the unilateral group. In the 2 to 5 year group the preponderance occurred in the unilateral and negative groups, and the bilateral group showed the smallest number. Between the sixth and eighth years the bilateral and the negative groups were both larger than the unilateral group. Therefore no evidence of a hereditary influence was seen among this group of children. It appears that, when children alone are the subject of a study, the absence or presence of allergy in other members of the family appears to have little influence on the age at which allergic symptoms manifest themselves. The preponderance of hay fever cases in data pertaining to adults has led to the impression that in patients with negative histories the onset is at a later age. Actually the onset of hay fever is later, and such patients present a lower incidence of positive family histories. Other clinical forms may also occur at any period, but from their data the authors find that eczema occurs earliest; the average age of onset of asthma and urticaria is intermediate. Persons with

an onset after puberty are usually hay fever sufferers. The difference in the age at which allergic syndromes ensue is more likely caused by variations in the type of the allergen and allergic syndrome rather than by genetic differences.

# Journal of Immunology, Baltimore

40:243-398 (March) 1941

- Dissociation of Beta Hemolytic Streptococci Revealed by Size of Hemolytic Zone on Blood Agar Plates. M. Solotorovsky and L. Buehinder, New York.—p. 243.  
Long Term Variations in Titer of Neutralizing Antibody for Influenza Virus in Serums of Adults and Children. R. Hare and W. C. Richm, Toronto, Canada.—p. 253.  
Active Immunity to Influenza Virus in the Mouse. R. Hare, Toronto, Canada.—p. 267.  
Rate of Complement Formation in Dogs. P. Wasserman, Cincinnati.—p. 281.  
Changes in Serologic Reactions and Tissue Sensitivity in Hay Fever Patients During Early Months of Treatment. W. B. Sberman, New York.—p. 289.  
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Reactivation of Neutralized Influenza A Virus by Dilution. R. M. Taylor, New York.—p. 373.  
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# Military Surgeon, Washington, D. C.

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- Physiologic and Psychologic Characteristics of Successful Pilots. A. D. Tuttle.—p. 227.  
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"Miners' Lung" (Pneumoconiosis, Silicosis, Anthracosis): Analysis of 227 Cases. C. C. Gill.—p. 264.  
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Aid to Regimental Dispensary Recording. H. S. Reid and E. K. F. Ronka.—p. 300.  
Vinethene: Suitable Anesthetic for War Surgery. W. I. Ogus.—p. 301.  
Medical Service at Battle of Little York (April 27, 1813). J. M. Phalen.—p. 307.

# Minnesota Medicine, St. Paul

24:145-214 (March) 1941

- Preliminary Report of the Special Otter Tail County Tuberculosis Survey: Summer 1940. L. J. Webster, Battle Lake.—p. 145.  
Coccidioidal Granuloma: Brief Review with Report of Case of Meningeal Involvement. W. M. Craig and M. B. Dockerty, Rochester.—p. 150.  
Anatomy, Physiology and Surgery in Duodenal Stasis. F. C. Schuldt, St. Paul.—p. 155.  
Report on Progress in Adrenal Therapy. J. L. McLeod, Grand Rapids.—p. 159.  
Incisional Hernia and Its Repair. A. E. Benjamin, Minneapolis.—p. 164.  
Dermatitis Medicamentosa: Teaching Summary. L. A. Brunsting, Rochester.—p. 169.  
Fractures of Distal Half of Tibia and Fibula. E. H. Juers, Red Wing.—p. 172.  
Diagnosis and Treatment of Conditions Associated with Varicose Veins. F. L. Smith, Rochester.—p. 175.  
Metastasizing Argentaffine Tumor of Cecum in Case of Multiple Colonic Malignancies. C. W. Mayo and W. D. Wilson, Rochester.—p. 178.

# New Jersey Medical Society Journal, Trenton

38:109-158 (March) 1941

- Early Care of Depressed Fractures of Malar Bone. V. E. Johnson, Atlantic City.—p. 113.  
The Physician and the Pharmacist. J. J. Debus, Jersey City.—p. 117.  
Problems Encountered in Diagnosis and Treatment of Uterine Cancer. L. C. Scheffey, Philadelphia.—p. 120.  
Transplantation of Ureters into Rectosigmoid and Cystectomy. C. C. Higgins, Cleveland.—p. 125.  
Pulmonary Fat Embolism with Recovery. I. L. Applebaum and G. F. Hewson, Newark.—p. 131.  
Digestive Disturbances in Hemorrhagic Diseases. T. Fitz-Hugh Jr., Philadelphia.—p. 132.

# Quarterly J. Studies on Alcohol, New Haven, Conn.

1:605-812 (March) 1941

- Alcoholism and Public Health. L. Kolb, Washington, D. C.—p. 605.  
Introductory Remarks to Symposium on Alcoholism of the Research Council on Problems of Alcohol. T. Parran, Washington, D. C.—p. 622.  
Effects of Alcohol on Electroencephalogram (Brain Waves). Pauline A. Davis, Waverley, Mass.; F. A. Gibbs, H. Davis, Boston; W. W. Jetter, Taunton, Mass., and L. S. Trowbridge, Boston.—p. 626.  
Motor Response of Colon to Alcohol. H. F. Adler, J. M. Beazell, A. J. Atkinson and A. C. Ivy, Chicago.—p. 638.  
Effect of Alcohol on Bile Volume and Constituents in Biliary Fistula Dogs. A. L. Berman, E. Snapp, A. C. Ivy and A. J. Atkinson, Chicago.—p. 645.  
Alcohol as a Food. C. P. Richter, Baltimore.—p. 650.  
Role of Insulin and Liver in Alcohol Metabolism. B. B. Clark, R. W. Morrissey, J. F. Fazekas and C. S. Welch, Albany, N. Y.—p. 663.  
Absorption of Alcohol, with Special Reference to Its Influence on Concentration of Alcohol Appearing in Blood. H. W. Haggard, L. A. Greenberg and G. Lolli, New Haven, Conn.—p. 684.  
Vitamin Deficiencies and Liver Cirrhosis in Alcoholism: Part II. Circulatory Disturbances: Part III. Pellagra. N. Jolliffe, New York.—p. 727.  
Drunkenness as a Criminal Offense. J. Hall, Bloomington, Ind.—p. 75f.

# Texas State Journal of Medicine, Fort Worth

36:717-770 (March) 1941

- \*Diagnosis and Management of Cancer of Breast. A. C. Christie, Washington, D. C.—p. 722.  
Endometriosis. H. M. Tigert, Nashville, Tenn.—p. 728.  
Habitual Abortion. H. Beavers, Fort Worth.—p. 730.  
Repair of Cystocele, Rectocele and Prolapse. G. F. Goff, Dallas.—p. 733.  
Few Notes on Prenatal Care. C. P. Hawkins, Fort Worth.—p. 738.  
Systemic Infections as Sequence of Paranasal Sinus Infection. O. M. Marchman, Dallas.—p. 742.  
Clinical Diagnosis of Early Syphilis. P. Brown, Fort Worth.—p. 745.  
Some Considerations in the Planning of State and Local Health Services. W. C. Williams, Nashville, Tenn.—p. 747.

# Diagnosis and Management of Cancer of Breast.—

Christie gives the following six points as guide to a course to be pursued in the treatment of mammary cancer: 1. A considerable percentage can be added to the five year survivals by a careful combination of radiation therapy with surgery. 2. Conservatism in the choice of patients for operation will reduce the total mortality. This will be accomplished by inducing women to come for operation earlier because of the greater percentage of cures among those operated on and because a less mutilating type of operation will be necessary. 3. Much can be accomplished by radiation therapy and minor surgical procedures in many cases which by properly revised standards should be considered inoperable. Such measures will add to the five year survivals, especially among elderly patients. 4. Roentgen castration should be a routine procedure in all women who have cancer of the breast and who have not passed the menopause. Pregnancy under such circumstances is especially dangerous. 5. The general management of the cancer patient requires the full cooperation of the general practitioner, the surgeon and the roentgenologist. 6. The 20 to 25 per cent of cures effected in cancer of the breast by radical operation can undoubtedly be improved if more patients can be induced to report as soon as anything abnormal is discovered in the breast. This will be greatly facilitated by more careful selection of cases for operation so that a much larger percentage of women will report themselves cured to their friends instead of exhibiting the results of an unsuccessful operation. Preoperative roentgen irradiation will probably improve the operative results by at least 10 and possibly 20 per cent. Also irradiation can assure a prolonged comfortable life to those whose disease is too advanced for surgery. An appreciable number of such patients may be clinically cured.

# West Virginia Medical Journal, Charleston

37:145-192 (April) 1941

- Industrial Hygiene and the Practicing Physician. J. W. Croxon, Charleston.—p. 145.  
Relation of Physical Defects to Scholastic Standing. A. C. Wooster, Parkersburg.—p. 150.  
Subtotal Infarction of Kidney (Nephrectomy, Cure). J. M. Emmett and M. L. Dreyfus, Clifton Forge, Va.—p. 154.  
Late Toxemias of Pregnancy. C. L. Goodhand, Parkersburg.—p. 157.  
Viruses. R. M. Wylie, Huntington.—p. 165.  
Soil in Relation to Health. C. R. Orton, Morgantown.—p. 171.  
Conservative Treatment of Small Urethral Fistulas: Report of Two Cases. C. H. Engelfried and T. K. Laird, Montgomery.—p. 173.  
The Child in the Public Health Program. J. M. Saunders, Washington, D. C.—p. 175.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

## British Medical Journal, London

1:263-304 (Feb. 22) 1941

\*Prevention of Gas Gangrene Infections in Experimental Wounds by Local Application of Sulfonamide Compounds and by Serums. F. Hawking.—p. 263.

Activation of Thromboplastin Preparations by Hemolysis and by Lecithin. A. Crosbie and H. Scarborough.—p. 268.

Cyclical Mucosal Ulceration. M. H. Pappworth.—p. 271.

Some Recent Air Raid Casualties. Margaret Ball and G. Quist.—p. 273.

Metabolism, Excretion and Human Requirements of Calcium. R. A. McCance.—p. 276.

**Prevention of Gas Gangrene Infections.**—Hawking determined the effect of sulfonamide compounds and antisera on the prevention of gas gangrene in experimental wounds. The wounds were made in guinea pigs, one of the compounds was applied, a massive inoculation of *Clostridium welchii*, *Clostridium septicum* or *Clostridium oedematiens* was introduced, the wound was closed and the efficiency of the treatment determined by the survival or death of the animal. Most control untreated animals died in twenty-four hours and showed the typical infection. Smears from the wounds of treated animals on the third day invariably revealed many clostridia. Macroscopic observation after the insertion of sulfanilamide, sulfapyridine or sulfathiazole in solid form subcutaneously or intraperitoneally revealed no signs of local inflammation. Microscopically a diffuse infiltration with polymorphonuclears and monocytes was found, but this was no larger than would occur with any foreign body. Sodium sulfapyridine, however, was very irritant, being strongly alkaline. Sulfathiazole was distinctly more active against *Cl. welchii* than sulfapyridine, while sulfanilamide occupied an intermediate position. The total survivals of all experiments with the four substances were: controls 0/18, sulfapyridine 5/18, sulfanilamide 8/18, sulfathiazole 10/18 and the mixture of two parts of sulfanilamide and one part of sulfathiazole 13/18. Sulfathiazole was the most potent compound against *Cl. septicum* (survivals 75 per cent); sulfapyridine was inferior (38 per cent), sulfanilamide had practically no action (0 per cent) and the effect of the "mixture" was 41 per cent. The survival of animals infected with *Cl. oedematiens* after sulfanilamide and sulfathiazole was somewhat more numerous than that among the controls, but not significantly so. Life was often prolonged, the differences between the "guinea pig-day indexes" being just great enough to be statistically significant (probability, 1:20). In order to ascertain that survival was due to the specific action of the sulfonamide compounds, comparisons were made with sodium chloride, calcium carbonate and urea. Calcium carbonate or urea had no power to prevent infection, while sodium chloride favored its development. Comparison with other antibacterial compounds (benzyl sulfanilamide derivative and prontosil soluble) showed them to possess little or no activity. The survivals after *p*-benzyl-aminobenzene sulfonamide and prontosil rubrum were similar to those after sulfathiazole; but the clinical condition of the wounds was definitely worse. Nitrobenzene-sulfonamide was no better than sulfathiazole. Proflavine applied in strong concentration will certainly prevent infection of a wound by anaerobes subsequently inserted. On being reopened on the third day the wounds showed fairly healthy tissues and only a few bacilli. Nevertheless the mediocre results obtained with acridine compounds in the last war indicate that the value of proflavine is probably limited. Local treatment saved 58 per cent of animals infected with *Cl. welchii* and *Cl. septicum*; systemic (intraperitoneal) treatment, even if given two hours previously, saved only 23 per cent. The effect of delaying local treatment was studied with *Cl. welchii* and with *Cl. septicum*. When treatment was immediate, 20 of 30 animals survived; when delayed two hours, 3 of 15 animals survived and when delayed six hours none of 6 animals survived. None of the 30 controls survived. In the treatment of animals with antisera the wounds were made according to the standard technique and the serum was injected intraperitoneally before or after the operation. On the third day the wound was reopened to remove the cloth, and the dose of antiserum was repeated.

Two experiments were performed, the first with concentrated monovalent sera against the three clostridia and the second imitating the conditions in a casualty department where antitoxin is given prophylactically against an unknown infection. For this a commercial polyvalent serum containing *Cl. welchii*, *Cl. septicum* and *Cl. oedematiens* antitoxins was injected intraperitoneally at operation or at various subsequent periods. Monovalent sera specific for *Cl. welchii*, *Cl. septicum* or *Cl. oedematiens* protected the guinea pigs against the respective organisms. The polyvalent serum gave protection against most strains of *Cl. welchii* and *Cl. oedematiens* but not against *Cl. septicum*. The transference of these results to human cases is not quite legitimate, but they do suggest that treatment along these lines would be beneficial to casualties. The treatment is innocuous and nonirritant. A number of air raid casualties and street accidents have received such treatment at adjacent hospitals, and the results have been extremely satisfactory, even in wounds with heavy initial contamination. So far as gas gangrene is concerned the treatment is chiefly prophylactic; and it is a supplement to proper surgical measures and not a substitute for them. Since serum and drug supplement each other, the ideal procedure for general use should include both.

## Journal of Mental Science, London

87:157-312 (April) 1941

Observations in Hypoglycemia: Oral and Facial Movements. W. Mayer-Gross.—p. 157.

Influence of War on Mental Disease: Psychiatric Study. R. E. Hemphill.—p. 170.

Tests of Psychomotor Efficiency in Patients Treated with Metrazol. J. J. O'Connell and L. S. Penrose.—p. 183.

Study of Binet and Cattell Systems of Intelligence Testing in a Colony for Mental Defectives. J. C. Rohan.—p. 192.

Psychobiologic Approach to Acute Anxiety Attack. H. A. Palmer.—p. 208.

Spinal Injuries in Convulsion Therapy. L. C. Cook and D. E. Sands.—p. 230.

Psychic Illness Among Services in Singapore. W. R. Logan.—p. 241.

Treatment of Mental Disorders by Electrically Induced Convulsions. R. E. Hemphill and W. G. Walter.—p. 256.

## Lancet, London

1:235-268 (Feb. 22) 1941

Development of Provincial Medical Education Illustrated in the Life and Work of Charles White of Manchester. A. H. Burgess.—p. 235.

\*Chemotherapy of Gas Gangrene. J. McIntosh and F. R. Selbie.—p. 240.

Meningitis Following Spinal Anesthesia: Report on Eleven Cases. H. J. Barrie.—p. 242.

Culture of Intestinal Protozoa. S. Adler and Annie Foner.—p. 243.

Dysentery Due to *Bacillus Dysenteriae* Newcastle: Prevalence in Edinburgh. A. J. Rhodes.—p. 244.

**Chemotherapy of Gas Gangrene.**—McIntosh and Selbie obtained a virulent culture of *Clostridium welchii* which produced a 100 per cent mortality in mice within twenty-four hours after its intramuscular injection. They found that 20 mg. of sulfanilamide given locally delayed death considerably after subcutaneous injection of cultures of *Cl. welchii*. When the local dose was increased to 40 mg. the average time of survival was greatly increased. Comparison of the effects of the local administration of 40 mg. of sulfanilamide and 50 mg. by mouth within six hours shows that all mice treated locally (by injecting the drug suspended in the infecting inoculum) survived for three days, whereas those given sulfanilamide by mouth had an average survival of only one day. Combined local and oral treatment revealed that when an adequate amount is given locally there is no great advantage in giving more by mouth. As with sulfanilamide against *Cl. welchii*, local administration of any of the three sulfonamides (sulfanilamide, sulfathiazole and sulfapyridine) in all three causal organisms (*Cl. welchii*, *Cl. septicum* and *Cl. oedematiens*) is more effective than oral treatment and there is no apparent advantage in supplementing local by oral treatment. All three drugs are of some value in delaying death, but sulfapyridine is of slightly greater value than sulfanilamide against *Cl. welchii* and *Cl. oedematiens*, and sulfathiazole is significantly more effective than the other two drugs against *Cl. septicum* and *Cl. oedematiens*. Local treatment becomes less effective if its administration is delayed; therefore the sulfonamide drugs, if they are to be of considerable value in the treatment of gas gangrene, should be administered at the site of infection in large quantities and as soon as possible.



# CURRENT MEDICAL LITERATURE

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## Presse Médicale, Paris 49:25-40 (Jan. 8-11) 1941

- Sulfonamide Therapy in Cerebrospinal Meningitis Due to Meningococcus. C. Gernez and C. Huriez.—p. 25.  
\*Incidence and Importance of Intestinal Parasitism in Early Infancy: Its Place in Preventive Medicine. F. Coutelen.—p. 29.

**Intestinal Parasites in Preschool Children.**—Coutelen conducted systematic stool tests for three years on 649 healthy nursery school children aged from 2 to 6 years, of agricultural, factory and mining workers, living in and around Lille and Douai, in order to determine the incidence and variety of parasitic infection in normal persons. Altogether 1,847 fecal tests were completed, covering fifteen schools. The procedure included at least three completed anal analyses for each child and various additional concentration techniques (method outlined). Of the 649 children, 448 (69.02 per cent) were found to be parasitized. Multiple infection was found in 233 (56.69 per cent), as many as six varieties sharing the human host. Protozoa were discovered in 286 children (63.83 per cent), helminths in 273 (60.93 per cent). *Giardia lamblia* (in 195 children) and *Endamoeba coli* (in 160) accounted for most of the protozoic infection. The helminths were represented by *Trichocephalus trichiura* in 170 children, by *Oxyuris vermicularis* in 129, by *Ascaris lumbricoides* in 58 and by *Blastocystis hominis* in 155 children. Sex played no part except for pinworm infection. The incidence here in girls was almost twice that of boys (22.51 per cent against 11.45 per cent in Lille, 21.52 per cent against 12.71 per cent in Douai). Age seems to have only an inconsiderable effect on the incidence of infection. Fewer cases of parasitism (43.33 per cent) were observed among children of agricultural workers. Familial incidence was significant, *Giardia* occurring in 54 per cent of the children, *Endamoeba coli* in 58.33 per cent; oxyuriasis led with 87 per cent in the children of twenty-four families examined in Lille. The average index rising to 92.15 per cent. *Taenia saginata*, *Ancylostoma duodenale* ("Old World" hookworm), *Endamoeba histolytica*, *Strongyloides stercoralis* and *Hymenolepis nana* were not encountered. The author regards systematic and thorough fecal analyses of presumably healthy persons as valuable prophylactically and, when applied to sections of the population, as possessing epidemiologic significance. The possibility of latent intestinal parasitism in very young children needs to be kept in mind in general practice as well as in family and institutional involvements.

## Schweizerische medizinische Wochenschrift, Basel 71:49-80 (Jan. 18) 1941

- Perilunar Luxation of Hand. A. Rauber.—p. 49.  
Clinical Observations of Myocardial Infarcts. R. Levi.—p. 54.  
Electrocardiographic Analysis by Means of Vectoranalysis and Electric Fields. R. Burger and F. Wührmann.—p. 65.  
Acanthosis Nigricans Hereditaria: Case. P. J. Schwarz.—p. 72.  
\*The Meinicke Flocculation Test in Legal Medicine. F. Naville and R. Herrmann.—p. 74.

**Meinicke's Flocculation Test in Legal Medicine.**—Naville and Herrmann stress the value of the Meinicke flocculation test for syphilis, in cases of sudden death, to determine the actual pathogenic picture and as an aid in assuring purity of cadaver blood before transfusion. The results of flocculation tests made on 50 cadavers were found to be in harmony with the anatomopathologic conditions. Experiments on living subjects indicated that the Meinicke test remained positive a longer time in the blood than the Bordet-Wassermann reaction. The Meinicke test was never negative when the Bordet-Wassermann was positive, but the Meinicke test might run the whole gamut from slight to intensive positive reaction when the Bordet-Wassermann was negative. The same relations were found for cadaver blood. Hence the two tests are needed in combination for transfusions to eliminate the danger of blood infection. The differences observed by other investigators in the Bordet-Wassermann reaction are attributable to the diversity of technical conditions encountered in the withdrawal of cadaver blood. Two cases of sudden death selected from several reported by the authors demonstrate the etiologic value of the Meinicke test. A workman aged 44, the father of two healthy children, fell dead on the street on his

way to work. He was never known to have been ill. The Meinicke test was slightly positive. At necropsy serious syphilitic lesions were found in the myocardium, coronary arteries and the aorta. A 33 year old well mother of a single healthy child was suddenly seized with a severe headache, a condition to which she was not previously subject. After two epileptic convulsions with coma she died, eight hours after the onset of the headache. The test was positive. The necropsy revealed an aneurysm in the sylvian artery, is simple and requires no extensive equipment (procedure given). Blood is usually obtainable in sufficient quantities by subclavicular puncture but must be withdrawn as early as possible, not later than thirty-six hours after death, and be promptly placed in cold storage.

## Deutsche Zeitschrift für Chirurgie, Berlin 254:1-72 (Sept. 17) 1940. Partial Index

- Renal Calcifications. H. Bauer.—p. 1.  
\*“Lingering” Fractures (March Fractures). Wilhelm.—p. 11.  
Myositis Ossificans Traumatica. G. von Pannwitz.—p. 20.  
Coxa Valga in Congenital Luxation of Hip Joint. A. Brundiers.—p. 39.  
Unusual Cutaneous Papilloma of Breast: Case. J. Schilling.—p. 64.

**“March” Fractures.**—Wilhelm discusses the pathogenesis of spontaneous metatarsal and pelvic fractures observed with relative frequency in the Polish campaign and seen under the stress of military drill and forced marches in young healthy recruits usually of athletic build and physically unconditioned because of a life devoid of sports activities. There is no history of trauma, infection or neoplasm, nor are the patients conscious of a sudden pain at the time of onset. They continue their military tasks under difficulties until pain and edema call a halt. On roentgen examination a true fracture with fissure and callus formation is seen. Healing proceeds as in bone fractures caused by a trauma. Three case histories are selected by the author and related to the literature on the subject. In 1 case the lesion persisted with no callus formation even after six weeks of rest and foot immobilization. Metatarsal fractures call for prolonged rather than abbreviated rest. Multiple vitamin deficiency (A, C and D) may be involved. Pain of obscure origin in the metatarsus or pelvis after sustained walking or marching needs to be promptly examined roentgenologically. The value of sports, including barefoot walking, in building the musculature and ligamentous structure of the feet, cannot be overestimated.

## Klinische Wochenschrift, Berlin 19:1073-1096 (Oct. 19) 1940

- Melanophore Hormones and Dark Adaptation. A. Jores.—p. 1075.  
Congestions Before the Heart. F. Meyer.—p. 1077.  
\*Effect of Sulfonamide Derivatives On Air Craft Pilots. W. Meister and W. Hestermann.—p. 1080.  
Is Increased Nitrogen Excretion After Administration of Alcohol Indicative of a Toxically Increased Decomposition of Albumin? J. Melka.—p. 1082.  
EKG-Axonometer. I. von Zárday.—p. 1084.

**Effect of Sulfonamide Drugs on Air Craft Pilots.**—Meister and Hestermann investigated the problems of whether the sulfonamides, by inducing marked methemoglobinemia, can reduce tolerance to high altitude in fliers and lower their efficiency under conditions of curtailed oxygenation. The tests were conducted on 18 subjects, half of whom served for each test, after their normal performance under normal conditions had been determined. The first test was made in an under-pressure chamber after previous administration of paraacetylaminobenzenesulfanilid, 1 Gm. of which elicits a 20 per cent methemoglobin and induces cyanosis of the face, fingernails and lips. These 9 subjects were given from 1 to 1.5 Gm. three hours before the test. Cyanosis was plainly manifest. In the further altitudes were taken progressively at 1,000 meter advances at five minute intervals, while still higher altitudes were moderated to a 500 meter pace. In this test 6 of the 9 persons showed a tolerance reduction of only 500 meters, 3 none at all. In the second test the 9 subjects were treated for three days successively with several proprietary sulfonamides and set to inhale, under a gas mask, a mixture of oxygen and nitrogen (oxygen reduced to one third of normal levels) while writing numbers. Here the transition from the initial disturbances in writing was progressively followed to the point of the disrupt-

tion of the handwriting due to manifestations of tetany. Only 1 subject showed a reduced performance (by two minutes). He had shortly before the test contracted an infection associated with fever. Acute febrile processes are known to diminish tolerance to high altitude. The author concludes that no causal connection exists between methemoglobin formation due to the use of sulfonamide derivatives and impairment of flying efficiency.

### Monatsschrift für Kinderheilkunde, Berlin

85:1-164 (Nov. 28) 1940. Partial Index

- Arachnodactylia and Brachydactylia. E. Glanzmann.—p. 5.  
Erythroleukoblastosis of the Newborn: Case. H. Mellinshoff.—p. 70.  
\*Secondary Contracted Kidney and Genuine Sclerosis in Children: Case. S. Künstler.—p. 92.  
\*Parenteral Effect of Vitamin D. F. Thoenes.—p. 120.

**Secondary Contracted Kidney in Children.**—Künstler discusses the criteria of differentiating secondary contracted kidney from true sclerosis, both of which are found in children, on the basis of a case and the literature. In a case of nephrosclerosis in a boy aged 12 years, necropsy disclosed glomerulotubular nephritis with secondary contractions and considerable arterial and arteriolar sclerosis. The clinical picture of secondary nephritis is characterized by the anemic and cachectic appearance of the patient, early and persistent renal dysfunction, early cardiac insufficiency and hypertension, which, however, does not attain the high levels found in true sclerosis of the kidney. There is a long period of latency. Death may supervene, as in this case, from apoplexy. Necropsy of children discloses significant changes in the glomeruli and tubules, which represent a combination of inflammatory and degenerative processes consisting in atrophy and hyalinization. The interstitial connective tissue is increased. Regenerative formations are seen in the uriniferous tubules. Of all cases of contracted kidney found in children, those of a secondary nature are the most frequent and attributable to renal involvement due to children's diseases. The frequency of nephrosclerosis in children is a question. Its latency may last from ten to twenty years. The author includes a discussion of the benign and malignant forms of this disease with clinical suggestions.

**Parenteral Effect of Vitamins D<sub>2</sub> and D<sub>3</sub>.**—Thoenes reports the effect of vitamins D<sub>2</sub> and D<sub>3</sub>, intramuscularly given, on 34 young children (29 nurslings, 5 of preschool age) affected with rickets in different stages of evolution. Of these, 22 were treated with vitamin D<sub>2</sub>, the remainder with vitamin D<sub>3</sub>, usually in doses of 15 and 10 mg. The progress of the investigation was controlled by roentgenograms taken at regular intervals and frequently by the analysis of the phosphorus-calcium levels of the serum. The site of the injection was irradiated immediately after each injection by means of a sollux lamp for twenty minutes. Most of the children were treated with vitamin D<sub>2</sub> during the winter season. All children suffered from more or less serious coexisting diseases such as spasmophilia, rhinopharyngitis, otitis media and chronic bronchitis. The results demonstrated that vitamins D<sub>2</sub> and D<sub>3</sub> elicit the same curative effects without distinction, though not with the promptness observed in oral medication (about one week's difference). Craniotabcs, however, seemed to respond just as well to parenteral treatments. The delay in therapeutic response does not seem to be due to the fact that in parenteral dosing the participation of the liver is eliminated. Vitamins D<sub>2</sub> and D<sub>3</sub>, employed intravenously by another investigator cited by the author, resulted in a more rapid rise of the phosphorus content.

### Wiener klinische Wochenschrift, Berlin

53:1047-1064 (Dec. 20) 1940

- Hay Fever. G. Hofer.—p. 1047.  
New Method for Treatment of Gastric and Duodenal Ulcers. B. von Mezö.—p. 1049.  
\*Internal Treatment of Cholelithiasis. H. Kutschera von Aichbergen.—p. 1053.  
Sources of Error in Neurologic Tumor Diagnosis. E. Fichler.—p. 1055.

**Internal Treatment of Cholelithiasis.**—According to Kutschera von Aichbergen two different effects are aimed at in the treatment of cholelithiasis, depending on its stage: (1) control of the attack and (2) increased motility of the biliary system in an effort to expel the stones or to prevent their

formation. The treatment of biliary colic requires antispasmodic drugs. Not every biliary colic is caused by calculi. Colics may occur in cirrhosis of the liver, in gonorrheal disorders of the adnexa and in nervous, hyperexcitable young women. After a patient has passed through a severe biliary colic the nervous irritability must be reduced in order to decrease the predisposition to attacks. For this the author recommends mild antispasmodics and the application of warmth. Cholagogues and choleretics and foods that stimulate the flow of bile must be avoided during this period. Bile secretion cannot be permanently arrested, and, after the pains have subsided, efforts must be made to counteract the primary causes. These efforts have two aims: (1) removal of the existing gallstones and (2) prevention of the formation of new gallstones. The removal of gallstones is desirable if they cause pains; it is urgent in case of obstructive jaundice. If expulsion of the stones by potent choleretics and cholagogues proves impossible, surgical removal becomes necessary. The prophylaxis of new stone formation must be directed against the factors that bring on the formation of new gallstones. The author points out that every prolonged biliary stasis favors the development of concrements and stresses that, after a biliary attack has been arrested, choleretics and cholagogues must be given in order to stimulate the flow of bile. The pains involved in this hyperkinesis must be borne in order to effect adequate flushing of the biliary passages. The author evaluates different choleretics and suggests that infection plays an important part in the development of concrements. Medical therapy is effective only in the incipient stages of biliary infection; in the chronic infections surgical treatment is required. Dyscholia is another factor in the development of biliary calculi. This condition of the bile is the result of a hepatic disturbance, which in turn is brought on by gastrointestinal disturbances. For this reason the prophylactic treatment must first aim at a normal function of the gastrointestinal tract.

### Archiv für Japanische Chirurgie, Kyoto

18:1-264 (Jan.) 1941. Partial Index

- \*The Impedin Phenomenon in Human Tumors. H. Joh.—p. 1.

**Impedin Phenomenon in Human Tumors.**—The discovery by several observers of the impedin energy inherent in neoplastic tissues has provided a new immunobiologic method of approach in the study of the etiology of human tumors. According to this theory, as formulated by Torikata (Die Impedinerscheinung, Jena, 1930), the impedin energy resides only in the microbiologic lipoprotein bodies; hence the presence of impedin energy which can be demonstrated in any given tumor tissue may be taken to constitute a provisional proof of the microbiologic origin of neoplastic growth. In order to obtain further evidence to test this hypothesis, Joh examined the impedin phenomena with 30 specimens of human tumors removed by operation. The filtrates from tumor tissues were prepared by grinding 1 Gm. of the fresh material with 5 cc. of physiologic solution of sodium chloride containing 0.5 per cent phenol, and the technic of opsonic index study as employed by Wright was followed, using suspensions of *Staphylococcus pyogenes aureus*. The suspension of leukocytes was prepared from a normal living guinea pig which had been injected intraperitoneally with 10 cc. of neutral meat juice; a small cannula inserted into the abdominal cavity allows a desired amount of leukocyte-laden peritoneal fluid to be withdrawn for the observation of phagocytosis. The examinations were repeated three times for each tumor filtrate and the average value was used to express the impedin action of the tissue. The positive impedin phenomena were observed with filtrates prepared from small and large round cell sarcomas, polymorphous cell sarcoma, spindle and giant cell sarcomas, osteogenic sarcoma, lymphosarcoma, melanosarcoma and other miscellaneous varieties of sarcoma; negative impedin phenomena were obtained with practically all types of epithelioma, fat and fibrous tumors, vascular tumors and tumors of the nervous system. From these observations the author concludes that the etiology of sarcomatous neoplasms is microbiologic in nature and that when microscopic examination gives uncertain results the impedin test may be employed to differentiate sarcomas from other types of neoplastic processes.

## Book Notices

**Born That Way.** By Earl R. Carlson, M.D. Cloth. Price, \$1.75. Pp. 174. New York: John Day Company, 1941.

The author is a neurologist who has achieved great respect in his special work with spastic children. In this book he writes an autobiography full of interesting details concerning his own development from a helpless spastic-athetoid cripple to a position of distinction in the medical world. Woven into this story are lucid simple explanations of the neurologic, orthopedic and psychologic problems easily understandable by the layman. Parents reading this book cannot help but become inspired to greater yet rational hopes for their own offspring similarly afflicted. Among several recent accounts this work is by far the best and should be recommended strongly by physicians to parents of spastic children. For the neuropsychiatrist, especially interesting is the effect of concentration and attention in alleviating athetosis. Likewise increased oxygenation, moderate doses of alcohol and intellectual activity seem to decrease the disability. The reviewer suggests that neurologists and orthopedists can profit greatly by reading the book, even though it is written for the public, for then too will their therapeutic pessimism be largely overcome.

**Diseases of the Nervous System Described for Practitioners and Students.** By F. M. R. Walshe, O.B.E., M.D., D.Sc., Physician in charge of the Neurological Department, University College Hospital, London. Cloth. Price, \$4.50. Pp. 288, with 9 illustrations. Baltimore: William Wood & Company, 1940.

This is a primer in neurology. Whether such an elementary and superficial textbook on this subject is desirable and will prove useful to general practitioners and medical students is debatable. In any event the entire neurologic world cannot be other than disappointed that the editor of a leading neurologic journal and the most acrid critic among living neurologists should not have provided richer fare. As is to be expected from so eminent a neurologist, the limited information presented is, by and large, accurate; but there is no excuse for the numerous errors and bits of misinformation which the book contains. The statement on page 29 "that with cerebral disease incontinence . . . is not due to any special localization of the lesion" takes no cognizance of the excellent studies of Langworthy on the central innervation of the bladder which have been carried out for the past several years. In figure 1 the rubrospinal tract is shown as though it were a very important pathway, whereas in a man it is almost non-existent and there is no evidence that it plays a significant part in human neurophysiology. The illustration on page 33 which shows part of the fibers of the optic tract terminating in the pulvinar of the thalamus and the nervous impulses being thence relayed to the calcarine cortex is not in accord with the known facts concerning the visual system. The unqualified statement on page 50 that in association with increased intracranial pressure "the systemic blood pressure does not rise above normal" is by no means always true. The statement on page 51 that there "is sufficient evidence to make it reasonable to suppose that occasionally a head injury may act as an exciting factor in tumor development within the skull" is one of those loosely made suppositions unsupported by qualification or factual evidence which cause honest men much difficulty in the courts. On the same page the author states that the classification of gliomas is "largely arbitrary and of ephemeral value" and then proceeds to utilize the terminology usually applied to the three most common gliomas. The fact that he discusses only the more common types does not make the existence of the oligodendrogliomas or the ependymomas any the less real, their classification any more arbitrary or diminish the value of knowledge about them. There is no well controlled basis for the statement on page 51 that surgical intervention may serve to transform a benign into a malignant glioma; and the further statement that "Sooner or later all gliomas prove fatal" is simply not true. The same erroneous pessimistic prognostication appears on pages 60 and 61. The advice on page 55 that examination of the cerebrospinal fluid obtained by lumbar puncture be used in the differential diagnosis of cerebellar medulloblastomas is dangerous instruction to be placed in the

hands of the general practitioner and student and cannot be too severely condemned. The statement on page 55 that the protein content in the spinal fluid may be increased "up to 0.2 or 0.3 mgm. per 100 c.cms." is undoubtedly a typographic error. The "differential diagnosis" of vascular disorders of the brain on page 81 is confused and weak. The statement on pages 81 and 82 that high blood pressure usually accompanies atheroma of the cerebral arteries evidences an ignorance of observations at the necropsy table or a failure to correlate them with the clinical observations.

The remaining two hundred pages are similarly replete with errors and misstatements all of which cannot be detailed here, but in the event that this little book should prove popular it is to be hoped that they will be removed in subsequent editions.

There are practically no citations of relevant literature and no illustrations. This book is too elementary and the treatment of the subject matter is too misleadingly simplified to allow of its recommendation to students in American medical schools.

**A History of Medicine.** By Arturo Castiglioni, M.D., Research Associate in the History of Medicine at Yale University, New Haven. Translated from the Italian and edited by E. B. Krumbhaar, M.D., Ph.D. Cloth. Price, \$8.50. Pp. 1,013, with 443 illustrations. New York: Alfred A. Knopf, 1941.

This book is the first American edition of the author's volume in Italian, which was published in Milan in 1936. The translator, Dr. E. B. Krumbhaar, has added a new bibliography, many references and much modern information. The volume has made for itself a leading place in the literature of the history of medicine, having passed through three editions in Italian and having been translated previously into French, German and Spanish. This is much more than a textbook. Whereas many another history of medicine is simply a record of dates and events, this book is enhanced by interpretation and philosophical analysis of the trends in various periods. The illustrations constitute one of the most valuable contributions in the book. In the section on modern medicine the author has carefully analyzed progress in each of many fields and rightly mourns the degradation of scientific medicine in Germany. Professor Castiglioni recognizes the danger that the practice of medicine, if it becomes too scientific, may yet remove the doctor from the patient. Thus he says "The physician of today, better realizing the limitations of bacteriological and other technical aids, is experiencing the need of returning to the patient's bedside, from which medicine should never have separated itself. With the extreme swing of the pendulum too much faith has sometimes been placed on the pronouncements of the laboratory when, forgetting the importance of the clinical picture, physicians have based their activities too exclusively on laboratory criteria. For some years now physicians have tended through ignorance of the possibilities and limitations of laboratory methods either to place too much reliance on what came out of the four walls of the laboratory or not to take advantage of the information that it could properly give. They tended to pay more attention to the evidence of the microscope and of chemical reagents than to the information obtained by their own senses from examination of the patients in the wards of the hospitals. Today, with a better knowledge of these possibilities and limitations, they tend to scrutinize sagaciously the information received from both sources. Clinical instruction in the hippocratic sense fortunately never was completely neglected, and voices continued to maintain the necessity of returning to the classical paths, reinforced with the riches of newly acquired knowledge, but with the eye steadfastly fixed on the goal of the patient's welfare. All the marvelous discoveries of recent times cannot remove the physician from his post of honor in detecting morbid phenomena and following the mysterious rhythm of life and death: a post, that is, at the bedside of the patient."

Here is a new history of medicine in English which has an appeal not only for every physician but for every reader. The crowded condition of the curriculum makes it almost impossible for the average student to become aware of the tradition and inspiration that support the modern teaching and practice of medicine. He will do well to orient himself in his chosen field by a careful reading of Castiglioni's monumental work during the coming summer.

**Debatable Tumours in Human and Animal Pathology.** By W. F. Harvey, E. K. Dawson and J. R. M. Innes. Published for the Cancer Control Organisation of Edinburgh and South-East Scotland. Cloth. Price, 10s. 6d. Pp. 124, with illustrations. Edinburgh & London: Oliver & Boyd, 1940.

This book deals with nine tumors about whose origins and essential nature oncologists disagree. Each tumor is described and illustrated, and an opinion, which the authors admit is often dogmatic, is expressed on the debatable points. The bibliographies are incomplete but are "directional" and useful. The authors regard seminomas as arising from undifferentiated epithelium of the seminiferous tubules; the granulosa cell tumor as of primitive ovarian follicle cell origin; "mixed tumors" of the salivary glands as epithelial (adenoma and adenocarcinoma, regardless of morphology) and not bidermal; malignant melanomas as carcinomas—epidermal melanocarcinoma in the skin and neuroectodermal carcinoma in the eye—minimizing the neural theory; lymphoepitheliomas as either epidermoid or transitional cell carcinoma, or reticulum cell or lymphosarcoma; giant cell tumor of bone as a type of new growth intermediate between purely reactive tissue and blastoma; endothelioma as of mesodermic tissue origin and manifest as vasoformative or membranoformative and reuniting reticulo-endothelium and vascular endothelium; lymphosarcoma as arising from the embryonal, mesenchymal, stem cell of lymphoid tissue; meningiomas as arising from the mesodermic stem cells of the pachymeninx or leptomeninx which are of meningeal endothelium with membranoformative or vasoformative tendency. The authors revive and enlarge the Cohnheim concept, which they repeat often, that "... all tumors are developed out of those undifferentiated, embryonal cells which remain as such into adult life" (p. 3), ignoring the evidence derived from experimental cancerogenesis, and they ignore the somatic mutation theory. Using contributions of experimental embryologists, they reach some provocative conclusions. The chapter on endothelioma is especially good. This book demands the attention of all those who try to keep informed on these tumors.

**Aneurysms of the Cerebral Vessels with a Study of Thirty-Two Cases Found at 12,503 Consecutive Necropsies.** By Cullen Ward Irish, M.D., Sc.D. This study is a chapter from a monograph, "Vascular Encephalopathy," Submitted as a Thesis to the Graduate School of the University of Pennsylvania as a Partial Requirement for the Doctorate Degree in Neurology. Paper. Pp. 61, with illustrations. Ann Arbor: Edwards Brothers, Inc., 1940.

This monograph contains an excellent review of the literature and bibliography on aneurysm of the cerebral vessels. The etiology, symptomatology and incidence of cerebral aneurysms are demonstrated by reports of cases. Reports of cases of aneurysms of the anterior, middle and posterior cerebral arteries, the anterior and posterior communicating arteries and the internal carotid and the basilar arteries collected from the literature are presented. The author then reports data on the thirty-two cerebral aneurysms found in the course of twelve thousand, five hundred and three necropsies. Charts and drawings of the anomalies observed about the circle of Willis are included. The cases are discussed at length, and cases to demonstrate the symptoms of aneurysms in certain regions are reported. The type is readable, the photographs are clear and the text is interesting. Lithoprint as used in this book has its advantages in monographs of this type.

**Tumores dos nervos periféricos.** Pelo Dr. Walter Edgard Maffei, assistente do Departamento de anatomia patológica da Faculdade de medicina da Universidade de São Paulo. Tese para inscrição ao concurso de docência-livre da 9.ª cadeira, anatomia patológica (patologia geral e especial). Paper. Pp. 93, with 35 illustrations. São Paulo: São Paulo Editora Limitada Imprimiu, 1940.

This monograph on peripheral nerve tumors has been presented in application for the chair of privatdozent in the pathologic department of the Medical School of São Paulo, Brazil, and constitutes the third of a series on tumors of the nervous system. In the two previous monographs the author treated the subjects of gliomas and meningiomas. The work is written in Portuguese. The author first explains the anatomic and histologic particularities of the peripheral nerves. He then briefly reviews the different concepts of the etiology of peripheral nerve tumors, from the pioneer work of Cheselden to the present time. The subject matter is arranged from the clinical point of view, and in successive chapters the author discusses

(i) traumatic neuroma, (ii) solitary tumors of the nerves, (iii) multiple tumors of the nerves, (iv) malignant tumors of the nerves and (v) multiple tumors of nerves (von Recklinghausen's disease). He considers the differentiation of the von Recklinghausen syndrome from other entities, particularly leprosy. The differential diagnosis from leprosy is emphasized as being of great clinical importance. The monograph is well written and presents the problem clearly. There are good photomicrographs and illustrations of patients with von Recklinghausen's disease.

**A History of Contagious Disease Caro in Chicago Before the Great Fire.** By Constance Bell Webb, Social Service Department. Montreal General Hospital, Montreal. Paper. Price, \$1.25. Pp. 169. Chicago: University of Chicago Press, 1940.

This publication traces the progress of public health and health conditions in Chicago from the time this city comprised only an Indian agency, Fort Dearborn, Mr. Kinzie's Trading Post, a few huts of halfbreeds and the wigwams of the Pottawattamies, to the time of the great fire. In 1830 Chicago came into being and Fort Dearborn "disappeared." Three years before this time, in 1827, the state legislature passed a law providing for the punishment of any person rendering offensive or unwholesome, or obstructing or polluting any water course, lake, pond, marsh or common sewer. In July 1832 the first outbreak of cholera occurred when several companies of soldiers entered the fort. The author continues, in a well documented thesis, the history of health development in this early Middle Western settlement. One gains a good idea of the complexities and difficulties encountered by far sighted leaders in the struggle for healthful conditions in early Chicago. The text quotes in great detail from authentic sources the opinions, laws and resolutions passed and discussed by the town leaders. The Chicago Medical Society played a major part in the early health development of this city. However, since so little was known about cause and cure of disease, action often was late. This thesis probably will be of interest not only to the person interested in health development in Chicago but to persons interested in the early historical development and trend of medical thought during the nineteenth century.

**Anus, Rectum, Sigmoid Colon: Diagnosis and Treatment.** By Harry Elliott Bacon, B.S., M.D., F.A.C.S., Clinical Professor of Proctology, Temple University School of Medicine, Philadelphia. Introduction by W. Wayne Babcock, A.M., M.D., LL.D., Professor of Surgery, Temple University School of Medicine. Foreword by J. P. Lockhart-Mummery, M.A., M.B., B.C. Second edition. Cloth. Price, \$8.50. Pp. 857, with 507 illustrations, mostly original, by William Brown McNett. Philadelphia, Montreal & London: J. B. Lippincott Company, 1941.

In this edition approximately twenty-five illustrations and fifty references have been added. There is a new comment on colostomy, another on sacral resection and a new paragraph on the use of neosynephrin hydrochloride. Murrieta's operation for rectal prolapse is new to this work, and the author's operation for hemorrhoids has been rewritten. These and a few other minor changes complete the alteration; hence no new criticism is required. As was stated in the review of the first edition, the book is interesting and instructive and will prove valuable as a work of reference.

**Experimental Physiology.** By George H. Bell, M.B., B.Sc., Mulhhead Lecturer in Physiology, University of Glasgow, Glasgow. Second edition. Boards. Price, 6s. Pp. 192, with illustrations. Glasgow: John Smith & Son, Ltd., 1940.

The new edition of this manual is, like the first, adapted primarily to the needs of the author's laboratory, although it has been enlarged by inclusion of experiments used in other laboratories. Many of these are devised for human subjects and as such represent a distinct improvement over the previous edition. The manual is greatly improved in minor details and can be readily adapted to any standard physiologic laboratory. While better than the average, it still has no especially distinctive features.

**List of Respiratory Protective Devices Approved by the Bureau of Mines.** By H. H. Schreck. United States Department of the Interior, Bureau of Mines. Information Circular 7030R. Paper. Pp. 11, with illustrations. Pittsburgh, 1941.

This is the most recent revision of the list of approved respiratory protective apparatus issued by the Health and Safety Branch of the Bureau of Mines. Certificates of approval are issued only if the devices fulfil established requirements. These are discussed briefly in the circular.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### TYPHOID AND TYPHOID CARRIERS

To the Editor:—Can you give me any information as to whether or not a person may be a carrier of typhoid bacilli for any length of time and yet may be susceptible to this organism and acquire the disease?

M.D., Buffalo.

ANSWER.—Although uncommon, it is theoretically possible for typhoid carriers to contract the disease, and there are such instances on record. The explanation lies in several factors, involving personal variations in immunity to the disease after recovery and certain other aspects of the carrier state.

Epidemiologic surveys have clearly demonstrated that susceptibility to a given dose of typhoid organisms varies widely from person to person. Further, in those who have recovered from the disease, immunity is also a relative matter, so that large or overwhelming doses of organisms have produced the disease in such people, irrespective of whether they are carriers or not.

So-called healthy carriers have either (a) never suffered from the disease or (b) have had typhoid in a mild or unrecognized form. Certain individuals, called incubation carriers, harbor and discharge organisms for varying lengths of time, in one reported instance one hundred and seventeen days, before coming down with the disease. The mechanism and localization of invasion and the course of the bacillus through the body in healthy carriers has been shown to be identical with that followed in actual clinical typhoid. Later these people may succumb to the bacilli and contract the disease as the result of "recovered" carriers than to either the "healthy" or the "incubation" carriers. In any case it is a relatively rare occurrence.

Full discussion of this problem with references to original literature on the subject may be found in Gay, F. P.: Typhoid Fever (New York, Macmillan Company, 1918).

### LACRIMATION AND TEAR GAS

To the Editor:—1. Where can small quantities of "tear gas," i. e. sufficient to cause lacrimation in one person, be obtained? 2. Would it be harmful to a person exposed to it once or twice a month? 3. What are its composition and properties? I want it for some experiments on myself.

Amy Weiss, M.D., Chicago.

ANSWER.—There are many chemical compounds which may cause lacrimation. The most common form of "tear gas," however, is chloracetophenone or mixtures containing this compound.

1. Small quantities may be obtained from commercial firms whose names can be secured from the local police station. Small quantities may also be made in a well equipped chemical laboratory.

2. There is no permanent danger from repeated exposures to the gas in the concentrations to which exposure usually occurs. Occasionally, workmen may suffer a dermatitis in the manufacture of chloracetophenone. There are no known allergic ocular reactions from repeated exposures. Occasionally, if the face is freshly shaven there may be some transient burning or even redness of the skin. With high concentrations, difficult to attain under ordinary circumstances, burns may occur.

3. Chloracetophenone is, chemically, phenylchloromethylketone,  $C_6H_5COCH_2Cl$ . The pure material is a powder having an odor of ripe fruit. The melting point is 59 C., and the boiling point is 247 C. The compound is resistant to heat and moisture and persists in the open air, in the summer for days and in the winter for weeks. Chloracetophenone is not destroyed by boiling. The compound is only slightly soluble in water but is readily soluble in the organic solvents. The odor is reported to be detectable when the compound is present in the amount of 0.0002 ounce (0.0056 Gm.) per thousand cubic feet of air; the concentration is intolerable at 0.34 ounce (9.4 Gm.) per thousand cubic feet of air for three minutes. Chloracetophenone is usually made from acetic acid, chlorine, sulfur monochloride and benzene as catalysts. Exposure causes severe blepharospasm and lacrimation, which passes off rapidly

on exposure to a current of fresh air. The tears do not irritate the face. Usually no treatment is necessary, but, if the eyes continue to feel irritated, boric acid solutions may be used. The eyes must not be rubbed. Curiously, animals show no lacrimation from exposure to the usual concentrations of chloracetophenone.

### PROTECTION AGAINST DERMATITIS CAUSED BY ARSENITE AND CAUSTIC SODA SPRAY

To the Editor:—I have seen several men from ranches where the sodium arsenite is used who have had an eczematoid lesion which has involved the scrotum, the inner aspects of the thighs and the lower abdominal region. When these patients do not work with the sodium arsenite the lesion disappears, so that I feel certain that this substance is causing the cutaneous lesions. The men engaged in this work wear clothing consisting of long underwear, overalls, leather jackets and leather gloves. Any information which you can give which would further protect these men from the irritation caused by sodium arsenite would be appreciated.

M.D., Arizona.

ANSWER.—Dermatitis from arsenicals is not infrequent. Schwartz and Tulipan in "A Textbook of Occupational Diseases of the Skin," on page 305, state that ulcerations of the skin and of the nasal septum, as well as vesicular or vesicobullous dermatitis with crusting, localized on the lower part of the abdomen, groins and thighs occurs among workers handling arsenicals. On page 310 of the same work, arsenic trioxide and sodium arsenite are specifically listed as active irritants of the skin.

It is well known that sodium hydroxide causes ulceration of the skin when in concentrated solution and dermatitis in more dilute solutions (Schwartz and Tulipan, p. 113). The stock solution used for the eradication of mesquite consists of 8 pounds (3.6 Kg.) of arsenic trioxide powder and 2 pounds (0.9 Kg.) of caustic soda flakes dissolved in 3 quarts (liters) of water, forming a strongly alkaline, irritating and poisonous solution of sodium arsenite. Arsenic trioxide and caustic soda are themselves powerful cutaneous irritants and they soil the clothes will cause dermatitis and ulceration of the skin in the presence of perspiration. The long underwear and the coveralls worn by the workers are conducive to perspiration, and the sites of heaviest perspiration, the groins and the belt line at the waist, are likely to show dermatitis from these powders penetrating the clothing. The finished stock solution when splashed on the clothes may soak through to the skin and cause dermatitis and ulcers. If it does not soak through to the skin and dries on the clothes, the perspiration coming through will redissolve the dried chemicals and thus allow them to come in contact with the skin and cause dermatitis and ulcers. The leather jacket and the leather gloves serve as better preventive clothing than the long underwear and coveralls because they are more impermeable.

The precautions to be observed by mixers of the stock solution, as published by the Southwestern Forest and Range Experiment Station, are as follows:

The "stock solution" should always be mixed in the open and within a larger container, such as a 10 gallon oil drum which has had one end removed. Especial care should be taken to avoid splattering of the materials on the skin or into the eyes. Gloves and eye glasses should always be worn by the worker. Avoid breathing any vapors which may arise from the hot liquid. The solution resulting is sodium arsenite, which is extremely poisonous if taken either externally or internally by animals or human beings.

These measures are not sufficient to prevent dermatitis. They should include the following additional precautions:

The stock solution should preferably be made under properly vented suction hoods. The mixer should wear rubber gauntlets, over which are buttoned sleeves of an impermeable material such as plovium, vinylite or koroal (Schwartz, Louis; Warren, L. H., and Goldman, F. H.: Clothing for Protection Against Occupational Skin Irritants, *Pub. Health Rep.* 55:1158 [June 28] 1940). Coveralls made of the same material should also be worn. The mixer should wear goggles in order to prevent the breathing of the poisonous dusts. If such suction hoods are not available, or if the stock solution must be made in the field, then it should always be mixed in the open and in large containers and the mixer should stand to the windward of the mixing pot and wear goggles, respirators, rubber gloves and such impermeable clothing as described above.

The workers diluting the stock solution should be required to wear goggles, gloves and impermeable coveralls or impermeable sleeves, and long aprons instead of coveralls, and also to stand to the windward side of the mixing basin.

The workers pouring the arsenic solutions into the trenches or when using the girdling method should be required to wear rubber gloves and impermeable coveralls or impermeable sleeves and long aprons.

After the solution placed in the basins or on the mesquite dries, the dust in the region may be carried by the wind into the clothes of the men and cause dermatitis. The dry residue from vessels and tools, if in sufficient quantity, may also permeate



the clothing of the workers and cause dermatitis. It is advisable that all men working at this occupation should wear impermeable clothing. This would obviate the necessity of wearing special underclothing.

### PHARMACOLOGY OF IPECAC

To the Editor:—Has there been any authoritative work done clinically or pharmacologically since 1937 on ipecac? If so, can you lead me to this or other information? What dose taken three times a day for an adult would be considered safe to be used for a period of two weeks? Would the dose of 1 grain (0.06 Gm.) as listed in the U. S. Pharmacopeia three times a day be satisfactory or should a greater or a lesser amount be given, depending on the pathologic condition as it existed, say, for example, acute bronchitis? Is ipecac in doses of 1 grain injurious if used three times a day for a period of ten to fourteen days? Has any one been seriously hurt by taking this quantity of ipecac for this length of time? Are there any records of death occurring from the use of this drug in the dose and the length of time expressed? Is there any information which shows the comparative toxicity of ipecac and emetine?

M. A. Hodgson, M.D., Memphis, Tenn.

ANSWER.—In none of the recent textbooks of therapeutics is there any stated limitation to the length of time ipecac may be used as an expectorant; indeed, the only limitation at all seems to be due to the nauseant property of the drug. Abroad the infusion of ipecac is much used, but in this country the syrup, which is generally considered to be more reliable, is almost universally employed; however, it should be noted that recently Weiss and Sprague (*Am. J. M. Sc.* 194:54 [July] 1937) have stated that they found considerable variation in the potency of various specimens of the syrup which they tested. Beckman (Treatment in General Practice, Philadelphia, W. B. Saunders Company, 1938, p. 24) said, in discussing the use of the syrup of ipecac as an expectorant, that the U. S. P. dose of 12 minims (0.74 cc.) is too large if the drug is to be repeated often (he considered that a dose every two hours is necessary for satisfactory expectorant action) and recommended a dose of 5 to 8 minims (0.3 to 0.5 cc.) in order to avoid nausea. Thus his total dose in a twenty-four hour period—giving the drug every two hours from 8 in the morning to 10 at night—would be approximately  $4\frac{1}{2}$  grains (0.3 Gm.) of ipecac, since the official syrup contains 7 per cent; the U. S. P. dose would be slightly more than  $6\frac{1}{2}$  grains (0.4 Gm.). Nowhere does one find stated a limit to the length of time over which such a dose may be administered with safety. Indeed there does not seem to be much reason to fear that toxic symptoms will follow the administration of even large doses of ipecac. For example, Andresen (*Am. J. Trop. Med.* 6:119 [March] 1926), in the treatment of amebic dysentery, introduced a Jutte tube well down into the duodenum and after thoroughly washing out the intestine introduced 1 drachm (4 Gm.) of powdered ipecac and repeated this regimen daily seven times and after a week's rest went through the entire treatment again. There were no reports of systemic toxicity accompanying this regimen.

In earlier times there were many speculations with regard to the numerous substances obtainable from ipecac by extraction, but the theories with regard to the expectorant action of the drug finally settled down to three: first, that emetine was alone responsible; second, that cephalin was solely responsible, and finally, when saponin also was found to be present, the claim was made that it was the only true expectorant ingredient. However, the matter seems recently to have been settled on an experimental basis by Rosenthaler and Gordonoff (*Schweiz. med. Wchnschr.* 18:450, 1937), who, using rabbits and a roentgenographic method, showed that both emetine and cephalin were active as expectorants and that saponin was able to increase the action of either of the other ingredients either singly or in combination, though alone it was not very effective. Thus it would seem that no advantage is to be expected from administering emetine instead of ipecac for expectorant purposes.

That emetine alone is highly toxic is of course well known, but this fact should not cause great toxicity to be ascribed to ipecac. Ipecac was used for a long time as an expectorant without any concern over systemic toxicity before the introduction of its active ingredient, emetine, in the treatment of amebic dysentery by Rogers in India in 1912. And it is to be pointed out further that this use of emetine is solely parental, necessarily so because its nauseant properties prevent the administration of sufficient quantities by mouth for effective amebicidal action. It would seem that the toxicity of emetine under these conditions is not at all to be related to the toxicity of the emetine which exists as an ingredient in the syrup of ipecac when used for expectorant purposes.

### ANTIBODIES IN VACUUM-DRIED SERUMS

To the Editor:—I am unable to find much concerning lyophil antibody factors in the 1940 Quarterly Cumulative Index Medicus; there is some reference to dried plasma in relation to blood transfusion and to immune human serum but not about the immune serum or rather plasma in the solid dry form. I should like to get some information as to the fate of measles or scarlet fever antibodies for example, when they are dried and kept in the solid form under a partial vacuum.

Joseph H. Stickler, M.D., Baltimore.

ANSWER.—Vacuum-dried serums, that is, serums desiccated in vacuo from the frozen state by the lyophile, cryochem or desicav processes are definitely more stable than similar serums preserved in liquid form. Measles antibodies and scarlatina antibodies (excepting for antitoxin which is present in small amounts in human convalescent serum) cannot as yet be accurately titered, but those antibodies which can be accurately titered such as complement are shown to remain stable over long periods of time in the vacuum-dried state (up to three years or more) whereas under ordinary methods of storage in the liquid state there is a rapid deterioration with a loss of as much as 75 per cent in potency in a matter of days. It may be assumed that less labile antibodies than complement remain at their highest titer for even longer periods of time. The National Institute of Health has already allowed longer dating periods on vacuum-dried biologic preparations manufactured by certain commercial firms and human serum centers. Further information on this subject may be found in the references:

- Flosdorf, E. W.; Boerner, F.; Lukens, M., and Ambler, T. S.: Cryochem-Preserved Complement of Guinea Pig Serum, *Am. J. Clin. Path.* 10:339 (May) 1940.  
McGuinness, A. C.; Stokes, Joseph, and Mudd, Stuart: The Clinical Uses of Human Serums Preserved by the Lyophile Process, *J. Clin. Investigation* 16:185 (March) 1937.  
Flosdorf, E. W., and Mudd, S.: Procedure and Apparatus for Preservation in "Lyophile" Form of Serum and Other Biological Substances, *J. Immunol.* 29:389 (Nov.) 1935.

### CULTURE MEDIUMS FOR GONOCOCCI

To the Editor:—Would you please send or give me references to the best culture mediums for the gonococcus and the methods or technic involved? The cultural method offered by the Difco Laboratories is expensive, and I would like to use the culture method more frequently if I could prepare the culture mediums here.

D. T. Prehn, M.D., New London, Conn.

ANSWER.—The most satisfactory medium for the cultivation of gonococci in a small laboratory is the desiccated one marketed by Difco Laboratories under the name Bacto-proteose No. 3 Agar. It should be enriched just before pouring by the addition of  $\frac{1}{20}$  to  $\frac{1}{40}$  volume of sterile defibrinated blood of horse, sheep or rabbit (in that order of preference) or sterile ascitic fluid or, if none of these are readily available, Bacto-hemoglobin.

Many workers advise heating the blood to a dark brown. To do this, the melted agar may be allowed to cool to 70 to 75 F., the blood added, mixed and maintained at that temperature about ten minutes or until it looks like chocolate; then poured into Petri dishes.

Gonococci grow best at a temperature about 1 degree below customary incubator temperature, i. e. about 36 C. The addition of 5 to 10 per cent of carbon dioxide to the atmosphere usually stimulates growth. If the cultures are placed in a closed vessel, the carbon dioxide can be blown in from a tank or a Kipp generator, or a small bit of solid carbon dioxide may be dropped in before the vessel is closed, or enough sodium carbonate and dilute sulfuric acid can be put together in a beaker to evolve the required volume of carbon dioxide, which can be readily calculated.

### STIPPLED RED CELLS AND LEAD POISONING

To the Editor:—A man aged 52 has worked fourteen years as a furnace man in a lead refinery. He has 6 to 10 stippled red cells in each high power field. He has some of the symptoms of lead poisoning, including headache and prostration, but has no lead line, wrist-drop or abdominal symptoms such as colic and rigidity. What type of treatment is indicated and can he continue work?

J. E. Walton, M.D., Alton, Ill.

ANSWER.—Any one who has 6 to 10 stippled red cells in each high power field would be showing injurious effects of lead. It seems highly unlikely that a man would have that many stippled cells and still not have any lead line or lead colic, because this is a large number of stippled cells. If confirmed by further blood smears or, better, by additional evidence, the man should be relieved of his work until the stippling largely disappears. With the few symptoms present, probably the only treatment indicated would be ample calcium, best given in the form of milk.

# The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 116, No. 26

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CHICAGO, ILLINOIS

JUNE 28, 1941

## THE TREATMENT OF CHRONIC LEUKEMIA BY SMALL DOSE ROENTGEN RAY TECHNIC

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AND

JOHN S. LAWRENCE, M.D.

ROCHESTER, N. Y.

Leukemia is one of the most fatal of all diseases. No known cure exists. Once the diagnosis is established there is no ultimate hope for the patient, and the attending physician finds small comfort in the palliative role that his therapy plays. There is perhaps no disease to which the human body is heir which has shown so little progress in response to therapeutic measures. There is a fairly general agreement that the life expectancy is little if any prolonged by any known therapeutic procedure. Roentgen therapy is the accepted method today, and if it is properly administered and adjusted in amounts and frequency the comfort and efficiency of the patient can be increased by approximately 60 per cent.<sup>1</sup> If this cannot be accomplished, there is little justification for treatment. Acute leukemia should not be treated with roentgen rays, as there is seldom much response.

Despite the fact that roentgen therapy is the method of choice, there is great diversity of opinion as to the type of treatment to be used. Some advocate local (regional) treatment to the spleen or enlarged lymph nodes.<sup>2</sup> Irradiation of the chest has been tried and found effective.<sup>3</sup> Recently irradiation of the trunk has been advocated.<sup>4</sup> Others recommend irradiation of the entire body either by teleroentgen<sup>5</sup> or the Heublein method.<sup>6</sup> Individual dosage and frequency of treatment likewise are subject to wide variations. Many advocate moderate or small doses, but there is no general agreement as to what constitutes a small dose. A dose which was considered small several years ago might be con-

sidered large by today's standards. Until recently the literature on this subject had no accurate, uniform measurement of intensity but recorded doses in cutaneous erythemas or milliamperes minutes, stating the distance of the spark gap. The type of spark gap, whether point or sphere, was not always given. Such therapeutic chaos can be attributed to two factors: (1) the universal fatality of the disease and (2) the fact that there must be at least one and possibly two elements common to all technics of treatment with roentgen rays, namely the irradiation of lymphoid and myeloid structures or of the circulating blood. We feel that the latter of these two factors is the more important.

It is not our purpose in this paper to discuss in detail the various types of technic. Nor is any criticism directed at the many good articles on roentgen therapy of leukemia in the literature. The improvements in x-ray equipment and a better understanding of the physical factors, however, have rendered a number of our previous concepts of the various systems of dosage obsolete. For a thorough knowledge of any particular technic the reader is referred to the literature. Suffice it to state, however, that irradiation of the whole body is not without danger and is not applicable in all instances. The same difficulties are inherent in the Heublein method, and in addition the space required in conjunction with the specialized care needed in the conduct of the individual patient precludes this method from universal hospital and office use.

We wish to stress the individualization of the patient and the numerically small individual and total dose of roentgen rays required in roentgens (measured in air) to bring about a satisfactory response. The size of the area (square centimeters of surface) treated likewise is important, not only from the standpoint of back scatter but also from the volume of tissue actually irradiated. If, as some have stated, irradiation of the circulating blood is of primary importance,<sup>3</sup> not only the volume of tissue irradiated but the irradiated site would play an important part. If this is true, irradiation over the precordium,<sup>7</sup> the pulmonic fields, the spleen or the liver would probably show a greater response to a given number of roentgens per unit volume of tissue irradiated than would irradiation over enlarged lymph nodes in the axilla and the inguinal region. Our clinical observation would tend to bear out this point.

In any system of treatment the physical condition of the patient must be considered. This necessitates careful medical supervision and the general support of the patient with substitutional therapy as indicated. A close and sympathetic cooperation of the attending physician and the radiologist is imperative for the proper conduct of each patient.

We have attempted, during the past three years, to establish a small dose roentgen ray technic based on

From the Department of Radiology (Dr. Dowdy) and the Department of Medicine (Dr. Lawrence) of the University of Rochester School of Medicine and Dentistry and the Strong Memorial Hospital and Rochester Municipal Hospital.

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2. Desjardins, A. U.: Radiotherapy, *J. A. M. A.* 105: 2153-2161 (Dec. 28) 1935. Rosenthal, Nathan, and Harris, William: Leukemia: Its Diagnosis and Treatment, *J. A. M. A.* 104: 702-706 (March 2) 1935. McAlpin, K. R.; Golden, Ross, and Edsall, K. S.: The Roentgen Treatment of Chronic Leukemia, *Am. J. Roentgenol.* 26: 47-65 (July) 1931. Wits, L. J., and Levitt, W. M.: Treatment of the Leukemias, *Brit. M. J.* 1: 762-763 (April 11) 1936. Popp, W. C., and Watkins, C. H.: The Hematologic Diagnosis and Roentgenologic Treatment of Myelogenous Leukemia, *Radiology* 34: 663-667 (June) 1940. Leucutia,<sup>1</sup>

3. Duke, W. W.: The Treatment of Leukemia by Irradiation of the Chest, *Radiology* 1: 98-103 (Oct.) 1923.

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7. Warren, S. L.: Personal communication to the authors.

dosage in roentgens (measured in air) in relation to the site and area in square centimeters of the part treated. This resolves itself into regional treatment of the spleen, the liver and the various involved lymph nodes, or treatment to various portions of the trunk.

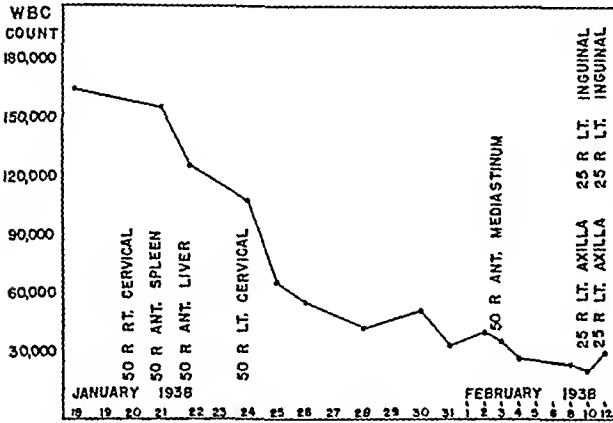


Chart 1 (case 1).—Chronic lymphoid leukemia. Local technic used. Portal 10 by 12 cm. Total 350 roentgens. Note gradual reduction of white blood cell count.

In the latter, the trunk is divided into the following areas: (1) the anterior part of the chest and (2) the abdomen and (3) the posterior part of the chest and (4) the abdomen, hereafter designated the quadrant technic in contrast to the regional. In most persons these various quadrants average fields of 20 by 20 to 20 by 30 cm. In no instance were the fields larger than 30 cm. in diameter. Occasionally the abdomen was divided into four areas for treatment, 10 by 15 or 15 by 15 cm. In several cases the quadrant technic was supplanted by regional therapy in order that localized areas of lymphadenopathy might be more adequately treated. The purpose of this study was to produce a technic which would give a gradual reduction of the total white blood cell count, with the least amount of irradiation and

treatment. It has been noted in this study that approximately the same total of roentgens was effective whether given in large doses (100 to 150 per treatment) or in smaller doses of 50 roentgens each (charts 4 and 5). The comfort of the patient, however, was much greater with the latter small individual doses.

No predetermined white blood cell level is selected. Each case is individualized. Patients with exceedingly high initial counts may be more comfortable if the count is not reduced below the range between 40,000 and 50,000, while in other persons the count may be reduced to 25,000 or even 10,000 with advantage. Leukemia with leukopenia, if not a result of therapy, is no contraindication to roentgen therapy, but here the individual dose must be small and the regional technic used. In leukemia with leukopenia the differential count in conjunction with the general condition of the patient is an important guide. A shift to the right with symptomatic improvement, in myeloid leukemia, indicates a satisfactory therapeutic response. In general, persons with a high percentage of adult white cells, without anemia and with a normal count of platelets respond best. However, good therapeutic responses have been

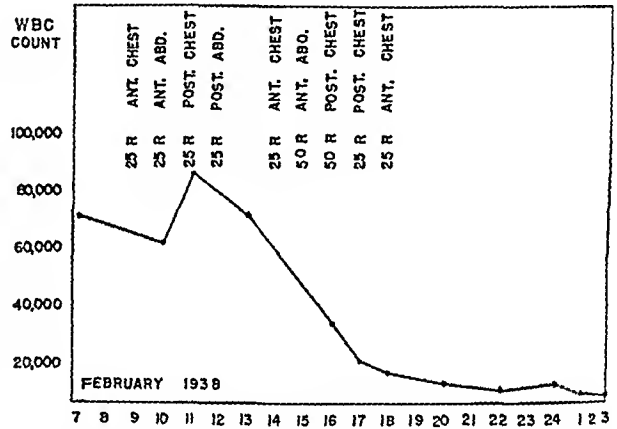


Chart 3 (case 3).—Chronic myeloid leukemia. Quadrant technic used. Portal 20 by 30 cm. Total 275 roentgens. Note slight increase in white blood cell count after first two treatments.

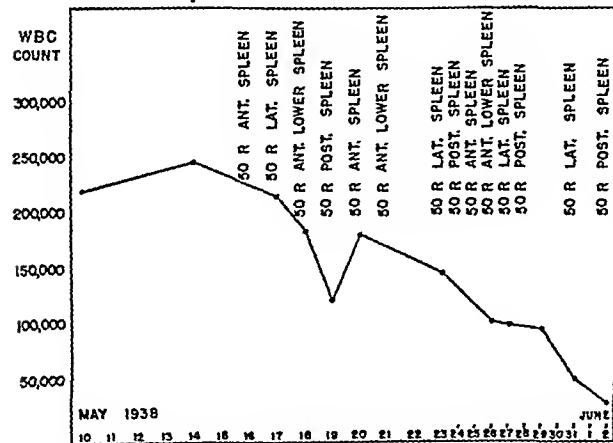


Chart 2 (case 2).—Chronic myeloid leukemia. Local technic used. Portal 10 by 15 cm. Total 700 roentgens. Irradiation confined to the spleen.

without any feeling of malaise or systemic reaction on the part of the patient such as increased toxicity. It was found that by either technic there was a decided variation in the threshold response in various persons. As the disease progressed, and with repeated series of roentgen therapy, there was noted the necessity of increasing the number of roentgens per individual

obtained when such was not the case (cases 2, 4 and 5). In chronic leukemia, severe anemia, few platelets and a high percentage of immature white cells in the circulating blood generally indicate a terminal case or, at least, one in severe relapse, and, as a rule, little symptomatic improvement can be expected.

We do not wish to imply that persons with chronic leukemia, having a low red blood cell count and a low hemoglobin content, should not be given the benefit of conservative roentgen irradiation. Infiltration of the bone marrow by leukemic cells crowds out the erythropoietic tissue and interferes with the normal production of the red blood cells. Judicious irradiation by the quadrant technic, in small individual doses of 25 to 50 roentgens (in air), may destroy large numbers of the leukemic cells within the bone marrow, thus allowing sufficient room for the erythropoietic system to function more efficiently.

#### TECHNICAL PROCEDURE

With a new patient it is important to establish the tolerance and the individual susceptibility of the disease to irradiation. If the person has never received roentgen therapy it is good practice to initiate the treatments by using the local technic to the spleen or enlarged lymph nodes with an initial dose of 25 or 50 roentgens

(in air) applied to an area 10 by 15 cm. to 15 by 15 cm. It is not uncommon to note a temporary increase in the total white cell count with these small doses (charts 3 and 4). However, if after three or four such daily treatments there has been no reduction in the

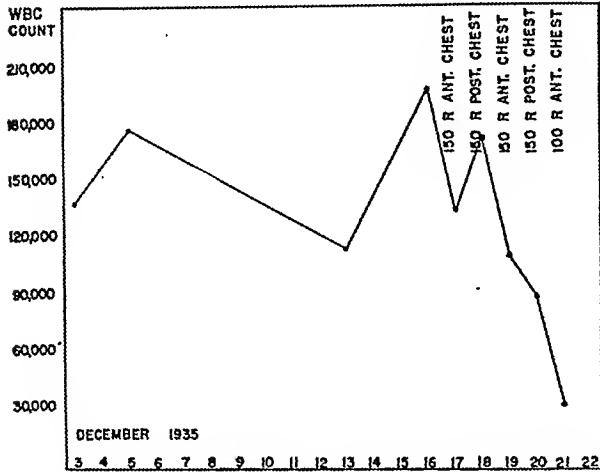


Chart 4 (case 4).—Chronic myeloid leukemia. Quadrant technic used with large individual dose. Portal 20 by 20 cm. Total 700 roentgens. Note precipitous fall in white blood cell count.

total count and no associated increase in toxicity or other systemic reactions, the dose may be increased or one may change to the quadrant technic. It is seldom, if ever, necessary to go beyond a daily dose of 75 roentgens with either of these methods. With the local technic, treatments should be daily. With the quadrant technic and doses of 50 to 75 roentgens, the frequency may in a certain measure depend on the patient's geographic location and economic status. A count of white cells should precede each treatment. The reduction in the total count should be gradual. A rapid decrease necessitates interruption of the treatments until the count is stabilized. In the treatment of leukemia with leukopenia, the local technic only is advised and the daily dose should not exceed 50 roentgens, preferably 25 roentgens applied to an area 15 by 15 cm.

Technical factors involved in our treatment were: 200 kilovolts and 25 milliamperes; a 50 cm. skin-target distance and a filter of 0.5 mm. of copper and 1 mm. of aluminum.

#### REPORT OF CASES

The following reports will illustrate the various types of leukemia and their response to the small dose roentgen ray method employing the local and quadrant technics.

**CASE 1.—Chronic lymphoid leukemia; local technic.** A white man aged 51 was admitted Jan. 18, 1938 with a progressive enlargement in the left cervical region of three months' duration. This was promptly followed by similar swellings in the right cervical region and in the left groin. Examination revealed generalized enlargement of the peripheral lymph nodes with enlargement of the spleen 5 finger breadths beneath the left costal margin.

The red blood cell count was 5,000,000 per cubic millimeter; the hemoglobin content was 13.6 Gm. per hundred cubic centimeters of blood and the white blood cell count 168,000 per cubic millimeter. The differential count was as follows: segmented cells 3 per cent, lymphocytes 95 per cent and monocytes 2 per cent. The bleeding time was three and one-half minutes and the clotting time six minutes. There was a slight clot retraction after thirty-six hours. The platelets revealed some reduction.

The short history of three months' duration and no anemia in conjunction with the patient's good general condition would

lead one to expect a good symptomatic response. Such a response was obtained by the local technic with doses of 50 roentgens and a total of 350 roentgens for the series (chart 1).

**CASE 2.—Chronic myeloid leukemia; local technic.** M. M., a white woman aged 57, was admitted May 9, 1938. She was chronically ill. Six years before this admission the patient had been seen in the medical service with chronic glomerulonephritis and generalized arteriosclerosis. Six months prior to the last admission she had noted a mass in the abdomen which increased in size to fill the entire left half of the abdomen.

Physical examination revealed that she was thin and sallow. The heart was enlarged to the left, with a loud systolic murmur heard at the apex. The blood pressure was 120 systolic and 76 diastolic. The spleen occupied the entire left half of the abdomen. The liver was slightly enlarged.

The red blood cell count was 3,500,000 per cubic millimeter; the hemoglobin content was 6.0 Gm. per hundred cubic centimeters of blood; the white blood cell count was 224,000 per cubic millimeter. The differential count of leukocytes was as follows: basophils 6 per cent, eosinophils 1 per cent, myelocytes 55 per cent, segmented cells 34 per cent and lymphocytes 4 per cent. The number of platelets had decreased. The non-protein nitrogen was 95 mg. and the blood protein level 6.7 mg. per hundred cubic centimeters of blood. The urea clearance was 28 per cent in the first hour and 18 per cent in the second hour. The basal metabolic rate was + 21 per cent.

The patient's general condition, in conjunction with anemia, the decrease in platelets and a high percentage of immature white blood cells, would make prognosis for remission guarded. The local technic was used (on small areas 10 by 15 cm. confined to the spleen) with individual doses of 50 roentgens. A satisfactory remission was produced with a total of 700 roentgens for the series (chart 2).

The patient has returned twice with exacerbation in the past two years.

**CASE 3.—Chronic myeloid leukemia; quadrant technic.** L. B., a white man aged 58, admitted Feb. 6, 1938, had arteriosclerotic heart disease.

Physical examination revealed an enlarged heart with signs of congestive heart failure. The Wassermann reaction was positive.

The red blood cell count was 4,100,000 per cubic millimeter; the hemoglobin content was 9.8 Gm. per hundred cubic centimeters of blood; the white blood cell count was 73,000 per

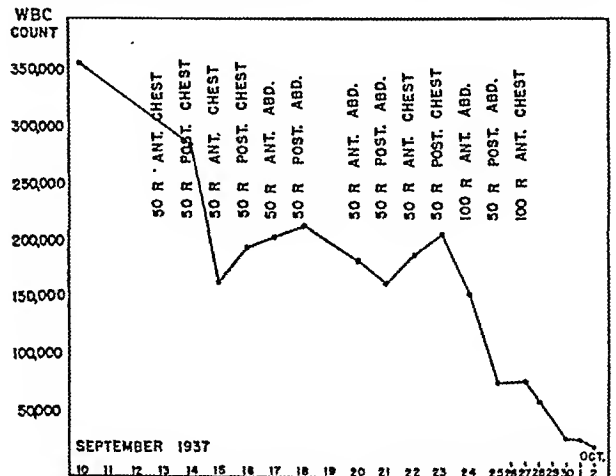


Chart 5 (case 4).—Chronic myeloid leukemia. Quadrant technic used with small individual dose. Portal 20 by 20 cm. Total 750 roentgens. Same case as represented in chart 4 twenty-one months later. Note gradual decline in white blood cell count.

cubic millimeter. The differential count of leukocytes was as follows: basophils 2 per cent, eosinophils 1 per cent, myelocytes 17 per cent, stab cells 3 per cent, segmented cells 75 per cent and lymphocytes 2 per cent. The platelets were greatly reduced in number.

While the patient's general condition was not the best, his blood picture suggested a fairly good prognosis for a remission,

in view of a high percentage of segmented cells. A remission was accomplished by the quadrant technic with individual doses of 25 or 50 roentgens each and a total of 275 roentgens for the series (chart 3).

The next case is presented to show the contrast between the large dose and the small dose method of

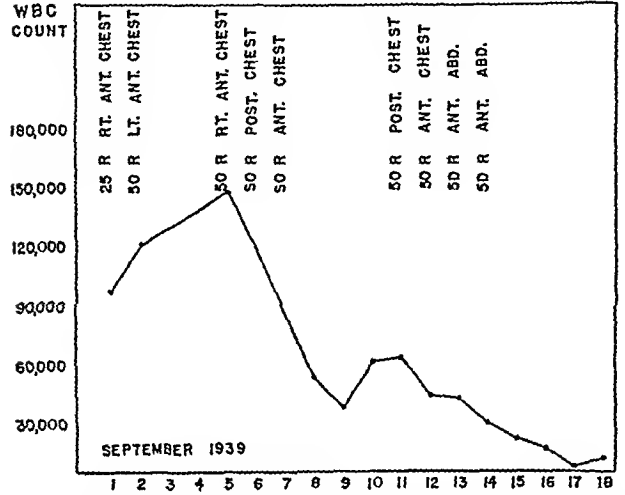


Chart 6 (case 5).—Chronic lymphoid leukemia. Quadrant technic used. Portal 15 by 15 and 20 by 30 cm. Total 425 roentgens. Note increase in white blood cell count after first two treatments.

treatment of the same person. The portal size was the same in each instance. There is a period of two years between the two series of treatments, represented, as indicated, by charts 4 and 5. The larger doses are shown by chart 4 and were given two years before the treatment represented by chart 5.

CASE 4.—Chronic myeloid leukemia; quadrant technic; contrast between large and small doses. E. S., a white woman aged 26, was admitted Aug. 2, 1935 with the diagnosis of latent syphilis, early myeloid leukemia, bismuth stomatitis, Vincent's angina and dorsal scoliosis resulting from previous poliomyelitis.

The red blood cell count was 4,070,000 per cubic millimeter, the hemoglobin content 10.6 Gm. per hundred cubic centimeters of blood and the white blood cell count 136,500 per cubic millimeter. The differential count of leukocytes was as follows: basophils 1 per cent, eosinophils 1 per cent, myeloblasts 3 per cent, myelocytes 15 per cent, juvenile cells 14 per cent, segmented cells 60 per cent and lymphocytes 6 per cent. Platelets were abundant.

The patient was given solution of potassium arsenite up to 24 drops a day, and the white blood cell count was reduced from 160,000 to 10,000 per cubic millimeter. She did not tolerate this medication well, however, and in December 1935 she was referred for roentgen irradiation. At that time the blood showed 3,620,000 red blood cells per cubic millimeter, 9.4 Gm. of hemoglobin per hundred cubic centimeters and 140,000 white blood cells per cubic millimeter. The differential count was basophils 1 per cent, eosinophils 4 per cent, myeloblasts 80 per cent, segmented cells 10 per cent and lymphocytes 5 per cent.

The blood picture at this time was not encouraging for a remission, which was accomplished, however, with four daily doses of 150 roentgens each and one dose of 100 roentgens, totaling 700 roentgens for the series. Irradiation was confined to the anterior and posterior portals of the chest. It will be noted from chart 4 that the white blood cell count had risen to 200,000 per cubic millimeter the day before the first roentgen treatment. It will be noted also that the fall in the total count was precipitous and reached 32,650 per cubic millimeter on the fifth day of treatment. We believe that such a rapid decrease in the total count should be avoided and that the amounts of irradiation were excessive. Subsequent irradiation was given in August 1936.

In September 1937 the patient was again admitted with the following blood picture: red blood cell count 3,100,000 per

cubic millimeter, hemoglobin 6.5 Gm. per hundred cubic centimeters of blood, white blood cell count 360,000 per cubic millimeter. The differential count of leukocytes was as follows: myeloblasts 7 per cent, myelocytes 34 per cent, stab cells 22 per cent and segmented cells 37 per cent. This was a period two years later in the course of the disease, and the anemia was more profound. A satisfactory remission was accomplished with 11 small doses of 50 roentgens each and 2 doses of 100 roentgens, totaling 750 roentgens. The quadrant technic was used. It will be noted in chart 5 that at this admission the reduction of the white blood cell count from 360,000 per cubic millimeter to 26,800 per cubic millimeter was accomplished gradually over a period of nineteen days. Such a gradual reduction, we feel, is important for the safety of and the general sense of well-being on the part of the patient.

The patient died Nov. 20, 1938.

We recognize the fact that this case does not offer a perfect comparison of the results of the two different types of technic in the same person. The blood picture during the admission, represented by chart 4, was decidedly unfavorable. At that time there were 80 per cent myeloblasts. The precipitous fall in the total white cell count may have been due to this large number of immature white cells rather than to the larger individual doses of roentgen rays used. Our present feeling, however, is that such a high percentage of immature white blood cells necessitates the most conservative treatment. During the admission represented by chart 5 the blood picture was more favorable in that there were only 7 per cent myeloblasts and 34 per cent myelocytes. The more severe anemia would indicate progression of the disease.

Case 5 represents one with an unfavorable prognosis; the patient had previously been overirradiated while living abroad.

CASE 5.—Chronic lymphoid leukemia; quadrant technic. F. L., a white man aged 79, was admitted Aug. 31, 1939. He was chronically ill. Physical examination revealed him to be emaciated, with generalized enlargement of the peripheral lymph nodes. The liver and spleen were enlarged 3 cm. below the

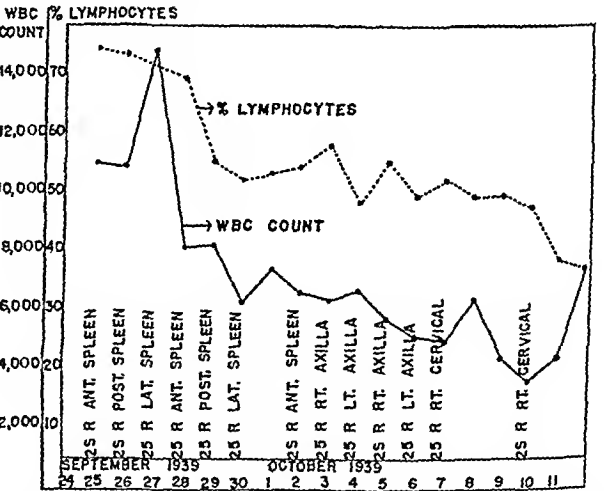


Chart 7 (case 6).—Chronic lymphoid leukemia with low total white blood cell count. Local technic. Portal 12 by 15 cm. Total 325 roentgens. The lymphocytes fell from 78 per cent to 42 per cent and the segmented cells rose from 9 per cent to 48 per cent.

costal margin. There were minute petechiae scattered thickly over both legs.

The red blood cell count was 2,200,000 per cubic millimeter, the hemoglobin content 7.4 Gm. per hundred cubic centimeters of blood, and the white blood cell count 65,100 per cubic millimeter. The differential count of leukocytes was as follows: segmented cells 3 per cent, lymphocytes 63 per cent and mono-



cytes 1 per cent; 33 per cent of the cells were unrecognizable and were classified as "smudges." The number of platelets was greatly diminished. Before roentgen therapy was instituted, the total white cell count rose to 102,400 per cubic millimeter.

Irradiation was instituted with small doses of 25 to 50 roentgens to areas 15 by 15 cm. over the chest, then changed to 50 roentgens by the quadrant technic (chart 6). With a total of 425 roentgens for the series the count gradually fell to 16,000 per cubic millimeter during a period of eighteen days. The proportion of segmented cells rose to 13 per cent, and the number of "smudges" dropped from 33 per cent to 12 per cent. The patient was discharged Sept. 19, 1939.

This case is interesting from the standpoint of the poor prognosis and in view of the patient's previous overirradiation, which had resulted in a temporary leukopenic phase of the disease. The severe anemia, the reduction in platelets and the multiple petechiae pointed toward conservative irradiation, if any.

**CASE 6.—Lymphoid leukemia with low white blood cell count; local technic.** H. R., a white man aged 37, was admitted on Sept. 19, 1939 with a diagnosis of lymphoid leukemia and an enlarged, painful spleen. The patient dated the onset two years previously, after lobar pneumonia. The patient was chronically ill.

There was slight pallor of the skin. Large, firm, tender nodes were noted in the anterior cervical and inguinal regions. The spleen was enlarged 4 to 5 cm. below the costal margin on the left.

The red blood cell count was 4,800,000 per cubic millimeter, the hemoglobin content 13 Gm. per hundred cubic centimeters of blood and the white blood cell count 13,900 per cubic millimeter. The differential count of leukocytes was as follows: eosinophils 1 per cent, stab cells 2 per cent, segmented cells 15 per cent and lymphocytes 82 per cent. The platelets were slightly diminished.

The patient was given small individual doses of 25 roentgens each locally to the spleen and to the enlarged nodes for a total of 325 roentgens. The total white cell count fell to 3,700 per cubic millimeter, and the segmented cells rose to 48 per cent. There was some reduction in the size of the spleen, with good symptomatic response. A note from the blood clinic on Jan. 16, 1940 stated that the white blood cell count was 10,400 and the red blood cell count 4,500,000 per cubic millimeter, the hemoglobin content was 13 Gm. per hundred cubic centimeters of blood, and the patient was symptomatically much improved.

#### COMMENT

In the past three years, we have treated 20 different patients afflicted with chronic leukemia, with individual small doses of roentgen rays by the local or quadrant technic or by a combination of the two. Of these, 9 are known to be dead and 1 was lost track of after a period of two years. These 10 patients lived an average of two and seventy-seven hundredths years after the onset of the disease. The longest period of survival was five years, and the shortest was one year and three months. It seems certain that the life expectancy is not altered by these smaller doses but, in our experience, it has resulted in an increased degree of comfort to the patient in comparison with the higher individual doses of roentgen therapy. During the treatment periods, the patients are practically free from nausea and vomiting or a feeling of increased toxicity. After a series of treatments, their convalescence is more rapid. We cannot state that relapses have been less frequent. Of the 20 patients, 19 have required an average of two series since they came under our control.

It is our firm belief that persons with chronic leukemia may be overirradiated, and to overirradiate a patient is to court disaster. Irradiation in each case must be individualized. Some patients are more susceptible to the unfavorable reactions following roentgen

therapy than others, and the sensitivity of the white blood cells, as indicated by their decrease in the peripheral circulation, varies from person to person and at different times in the same person. Consequently, the total count is no criterion as to the size of the single dose or the total amount of irradiation required for any one series. It is essential that daily white cell counts be done before irradiation in all cases of chronic leukemia. In leukemia with leukopenia, a daily differential count of leukocytes must also be carried out.

#### SUMMARY

1. Chronic leukemia will respond satisfactorily to much smaller individual and total doses of roentgen rays than those commonly employed.

2. The object of the treatment is to secure the maximum symptomatic improvement and the minimum discomfort with the smallest amount of irradiation.

3. Any individual dose which produces nausea or a feeling of increased toxicity is likely an excessive dose.

4. There is a noticeable variation in patients' tolerance and in the individual susceptibility of the disease to irradiation.

5. A clearcut small dose roentgen ray technic, such as is presented, should be employed for the treatment of chronic leukemia.

6. The method is practicable in the hospital or in office practice.

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## HEPARIN AS A PROPHYLACTIC AGAINST THROMBOSIS

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AND

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STOCKHOLM, SWEDEN

The use of heparin as prophylactic against thrombosis has arisen through our increased knowledge of this substance gained during the last few years. The latest developments in this field have been reviewed in two monographs of recent date.<sup>1</sup> The chemical nature of heparin is known. Being a mucicetin polysulfuric acid with not less than about 40 per cent of sulfuric acid, the heparin polysaccharide possesses an exceedingly high negative electric charge which enables it to react with some of the components of the coagulation system, preventing the coagulation of the blood. In the body it functions like a hormone, lessening the coagulability of the blood. Like other hormones, it is produced by a special kind of cells, the mast cells of the connective tissue, known to be located mainly in the neighborhood of the smaller blood vessels. The metachromatic granules of these cells consist of heparin. From these cells the heparin passes into the blood stream either directly or by means of diffusion. Under one experimental condition—peptone shock in the dog—heparin is thrown into the blood stream from these cells to such an extent that the blood is rendered completely incoagulable.

Since heparin is the body's own anticoagulant, it is the first one to be considered in attempts at counteracting thromboembolic complications. This idea was

From the Surgical Clinic I, Sabbatsbergs Hospital, and the Chemistry Department, Karolinska Institutet.

This investigation was aided by grants from the Rockefeller Foundation and from Stiftelsen Therese och Johan Anderssons minne.

1. Jorpes, Erik: Heparin: Its Chemistry, Physiology and Application in Medicine, New York, Oxford University Press, 1939. Mason, M. F.: Surgery 5: 451 and 618, 1939.

suggested in 1930 by Howell and MacDonald,<sup>2</sup> under whose guidance heparin was discovered, and it was followed up as soon as pure heparin became available in Stockholm and in Toronto, Canada. Since the pure product is harmless when given intravenously in moderate doses, the main obstacle had been the difficulty in obtaining it.

A valuable contribution to our knowledge in this field was made, therefore, when in 1933 Charles and Scott<sup>3</sup> of the Toronto group, working under Charles Best, found that heparin can be extracted on a large scale from the liver and lungs of cattle in a weakly alkaline solution from which the glandular residue is removed by coagulation in the presence of an excess of ammonium sulfate. From the alkaline extract the heparin is precipitated together with proteins on acidification. By further applying the same principles used by Howell a fairly good yield of heparin is obtained. A sufficient amount of heparin was obtained by this method for chemical analysis as well as for clinical experiments. Heparin was found to be a mucosin polysulfuric acid,<sup>4</sup> and once it had been established that it belonged to the same group of substances as chondroitin-sulfuric acid, its occurrence in the mast cells of Ehrlich could easily be demonstrated by means of the metachromatic stain, which Lison in 1933 had shown to be caused by these substances.<sup>5</sup> Successful experiments pertaining to its clinical use could also be started on animals as well as on man.

One of us (C. C.), working for many years on problems in connection with postoperative thrombosis, welcomed the possibility of obtaining heparin for experiments in this field. As soon as it had been shown in the spring of 1935<sup>6</sup> that heparin could be given intravenously in man in doses sufficient to cause heparinization lasting for fifteen hours, a systematic series of experiments was started on patients in August 1935 in order to study the influence of heparinization on the frequency of postoperative thrombosis.

A preliminary report<sup>7</sup> on these experiments was given in June 1937 (submitted for publication partly in February 1936 and partly in December of the same year). If the heparin used was sufficiently pure, it was found possible to perform the necessary heparinization of the patients. It was found less advisable to start the heparinization prior to or during the operation because of complicating hemorrhage. If the first intravenous injection was given three to four hours after the operation was finished there was no longer any danger of local hemorrhage in the field of operation. The heparinization was continued for the next three or four days either by giving repeated injections every fourth hour of the day or by means of an intravenous drip.<sup>8</sup>

In a series of convincing experiments on animals Murray and his associates<sup>9</sup> and Solandt and Best<sup>10</sup>

demonstrated the usefulness of heparin in preventing the formation of clots in blood vessels after different kinds of lesions of the vessels. Heparin was used by them in an operation on the brachial artery as early as the spring of 1935. Its usefulness in vascular surgery, particularly in arterial embolectomies, was more clearly described in a later paper.<sup>11</sup> Particular stress was laid on the possibility of preventing mesenteric thrombosis after splenectomies and resections of gangrenous parts of the intestine.<sup>12</sup> As to the work done by these authors on the postoperative prevention of thrombosis and on the treatment of acute thrombi in man by means of heparin, reference is made to three papers in 1937 and 1938<sup>13</sup> and to three recent<sup>14</sup> articles by Murray.

The second report by Crafoord,<sup>15</sup> in 1939, included 126 cases in which heparinization was regularly done after operation with four to six injections daily of 50 to 100 mg., making a total of 300 to 500 mg. of heparin a day. The use of the intravenous drip turned out to be fraught with such drawbacks that it was discontinued. Heparin was consequently given in single injections. Only occasionally a patient was awakened during the night to be given a dose. Usually the evening dose was somewhat larger, 100 to 150 mg.

The group of patients selected for postoperative heparinization consisted of persons over 35 years of age suffering from diseases with a fairly high percentage of thromboembolic complications. The patients selected submitted to operations on the gastrointestinal tract, on the biliary system or on the urinary passages or to major operations for hernia and varices. In this series the heparinization was continued over an average of seven days. The treatment with heparin was discontinued when the patient had a normal or a subfebrile temperature, had a better appetite and could move about fairly well, thus having circulatory conditions not far from the normal. The patient's general condition, temperature, pulse rate and blood pressure as well as the urinary status were followed in every case, and the blood picture was studied in 14 cases, in none of which were seen any undesirable reactions following treatment with heparin. In 5 cases local hematomas developed, four of them of no significance, but in the fifth case an infection occurred, erysipelas developed and the patient died, partly because of myocardial lesions.

In this group of 126 patients regularly treated with heparin there was not a single occurrence of thromboembolic complication. In the control series of 809 patients of about the same age and in the same department, undergoing similar operations, during the period 1935-1937, those followed after operation included 122 (15 per cent) displaying signs which could have been due to thrombosis, and among them 68 (8 per cent) presented definite thromboembolic complications. Among 129 operated on during the period 1937-1938 but not treated with heparin 33 showed signs of thrombosis and 20 showed distinct thrombosis. It should be pointed out that in this series of 129 non-heparinized patients during the period of heparinization of the others the patients were not suffering from circulatory disturbances or adiposity and were in good

2. Howell, W. H., and MacDonald, C. H.: *Bull. Johns Hopkins Hosp.* 46: 365, 1930.

3. Charles, A. F., and Scott, D. A.: *J. Biol. Chem.* 102: 425, 1933.

4. Scott, D. A., and Charles, A. F.: *ibid.* 102: 437, 1933.

5. Jorpes, Erik: *Biochem. J.* 29: 1817, 1935. Jorpes, Erik, and Bergström, Sune: *J. Biol. Chem.* 118: 447, 1937.

6. Holmgren, H., and Wilander, Olof: *Zischr. f. mikr.-anat. Forsch.* 42: 242, 1937. Holmgren, H.: Wilander, Olof, and Jorpes, Erik, *ibid.* 42: 279, 1937.

7. Hedenius, Per, and Wilander, Olof: *Acta med. Scandinav.* 88: 443, 1936.

8. Crafoord, Clarence: *Acta chir. Scandinav.* 79: 407, 1937.

9. This paper, which was among the first in the medical literature dealing with intravenous treatment with heparin in man, gave rise to a keen interest in this question. It has, however, not been mentioned by most subsequent writers in this field.

10. Murray, D. W. G.; Jaques, L. B.; Perrett, T. S., and Best, C. H.: *Canad. M. A. J.* 35: 621, 1936; *Surgery* 2: 163, 1937.

11. Solandt, D. Y., and Best, C. H.: *Lancet* 2: 130, 1938.

12. Murray, D. W. G., and Best, C. H.: *Ann. Surg.* 108: 165, 1938; *Heparin and Thrombosis: Present Situation*, *J. A. M. A.* 110: 118 (Jan. 8) 1938.

13. Murray, D. W. G., and MacKenzie, R.: *Canad. M. A. J.* 41: 38, 1939.

14. Murray, Jaques, Perrett and Best, 1937; Murray and Best.<sup>11</sup>

15. Murray, D. W. G.: *Brit. J. Surg.* 27: 567, 1940; *Heparin in Surgical Treatment of Blood Vessels*, *Arch. Surg.* 40: 307 (Feb.) 1940; *Surg., Gynec. & Obst.* 70: 246, 1940.

16. Crafoord, Clarence: *Acta chir. Scandinav.* 82: 319, 1939.

general condition, so that there seemed to be less reason to expect thromboembolic complications in them than in the heparinized group. The main reason that not all the patients were heparinized was the lack of technical help for administering the heparin postoperatively to so many patients. Under such conditions we naturally selected for treatment those who were regarded as being in most danger of thromboembolic complications.

The result of this first series of experiments on postoperative heparinization being promising, the public health board of the city of Stockholm made possible further experimentation in this line.

In the final series of 201 cases, the same principles were applied as earlier in the selection of patients as well as in the treatment. Heparin was given in single

chemically heterogeneous product with about 70 per cent of the strength of the strongest samples of heparin available, the mucoitin trisulfuric acid of Jorpes and the "crystalline" heparin of Charles and Scott. In the terms used by Best and his associates, it thus contains about 70 units per milligram. Seeing that the strength of this preparation can be kept sufficiently constant for practical use, we have preferred to express the dose in milligrams of this heparin. If there were a crystalline heparin of definite strength, it would be a reliable substance for reference. So far, however, it is too early to make any statements on this topic. Jaques and Waters<sup>16</sup> recently reported on heparin from the liver of the dog with a strength of 130 per cent of that of the "crystalline" heparin from the lungs of cattle.

TABLE 1.—Data on Patients Operated on During the Period Jan. 11, 1937-Jan. 5, 1940 Who Have Undergone Prophylactic Postoperative Treatment with Heparin (All Patients Aged 30 Years or Over)

Site of Operation	Number of Cases	Thrombo-embolism at Autopsy	Pain in Side and Bloody Sputum	Pain in Side but No Bloody Sputum	Symptoms in Legs (Swelling, Aching, Tenderness)	Total Certain and Suspected Thrombo-embolic Cases	Inexplicable Rise in Temperature and Pulse of Thrombo-embolic Type	Number with No Sign of Thrombo-embolic Complications
Hernia.....	97	0	0	0	0	0	0	97
	85	0	0	0	0	0	2	83
	44	0	0	0	0	0	0	44
	27	0	0	0	0	0	0	27
	11	0	0	0	0	0	0	11
Varices.....	19	0	0	0	0	0	0	19
Male genitals.....	20	0	0	0	0	0	1	19
Kidneys and urinary passages.....	13	0	0	0	0	0	0	13
Extremities.....	9	0	0	0	0	0	0	9
Total.....	325	0	0	0	0	0	3	322

TABLE 2.—Data on Patients Operated on During the Period Jan. 11, 1937-Jan. 5, 1940 Who Have Not Undergone Prophylactic Postoperative Heparin Treatment (All Patients Aged 30 Years or Over)

Site of Operation	Number of Cases	Thrombo-embolism at Autopsy	Pain in Side and Bloody Sputum	Pain in Side but No Bloody Sputum	Symptoms in the Legs	Total Certain Thrombo-embolic Cases	Inexplicable Rise in Temperature and Pulse of Thrombo-embolic Type "Uncertain"	Number with No Sign of Thrombo-embolic Complications
Hernia.....	90	0	8	0	2	8	5	75
Gallbladder.....	49	1	2	4	0	3	2	40
Appendix.....	74	0	7	1	0	8	4	63
Stomach.....	45	3	1	0	0	4	4	37
Cancer of colon and rectum.....	10	3	0	0	0	3	0	7
Varices.....	13	0	0	1	2	3	0	10
Male genitals.....	11	1	0	0	1	2	0	9
Kidneys.....	10	1	0	0	1	2	0	8
Total.....	302	9	18	6	6	33	15	218

intravenous injections, the number of which was limited to four daily. This time a somewhat smaller dose of heparin was tentatively given, usually 50 + 50 + 50 + 100 mg. of heparin of standard potency, making a total of 250 mg. a day. In certain cases 75 + 75 + 75 + 125 mg. was considered to be a more suitable dose. The first injection was given four hours after the operation.

The treatment was continued over a period of five to ten days, depending on the general condition of the patient. Particular stress was laid on an afebrile temperature and an almost normal mobility of the patient at the outset of treatment. During the last two days the dose of heparin was successively decreased.

The heparin used was a 5 per cent sterile solution of the commercial product manufactured by the Vitrum Company, Stockholm, in cooperation with one of us (E. J.). The strength of the preparation is kept fairly constant, within 10 to 15 per cent. It is an amorphous,

The results are given in tables 1 and 2. The tables include not only the last series of 201 cases in which heparinization was done from Nov. 1, 1938 to May 1, 1940 but the whole group of cases during a period of two and one-half years from Nov. 1, 1937 to May 1, 1940.<sup>17</sup>

Among the 325 patients given regular postoperative treatment with heparin there was not a single one with certain thromboembolic complications. In 3 cases only (1 per cent) a slight rise in pulse rate and temperature could have been caused by slight, undiagnosed thrombosis.

In the control group during the same period, comprising 302 unheparinized patients of about the same age undergoing similar operations, there were 33 (11 per cent) with certain thromboembolic complications

16. Jaques, L. B., and Waters, E. T.: *Am. J. Physiol.* 129: P389, 1940.

17. All the patients treated up till Oct. 31, 1939 were treated in the Surgical Clinic II of this Hospital, Prof. K. H. Gieritz, surgeon in chief.

and another group of 15 (5 per cent) with a rise in pulse rate and temperature of unexplained origin. There were 9 deaths in which the postmortem diagnosis was thromboembolism and 18 patients had pain in the side and bloody sputum.

This series is similar to the control series of 809 cases from the same clinic, previously referred to, in which operations of the same kind were done during the pre-heparin period (1935-1937), in which there were 8 per cent showing certain thromboembolic complications and another 7 per cent showing less definite signs. In the two series, or 1,111 cases, the corresponding figures were 9 and 6 per cent.

The tables can be supplemented by data on a series of patients with gynecologic disorders heparinized postoperatively by P. Wetterdal in the department of gynecology of the Sabbatsbergs Hospital.

TABLE 3.—*Influence of Operation on a Patient's Reaction to Heparin (The Time of Coagulation in Minutes After a Certain Dose of Heparin Is Given)*

Before Operation		After Operation					Diagnosis
Before Heparin Injection	30 Minutes After Heparin Injection	30 Minutes After Injection of Heparin					
		1-24 Hours	24 Hours	48 Hours	72 Hours	96 Hours	
4.70-4.55	11.10-11.45	9.00-9.15	9.45	11.45	.....	.....	Chronic cholecystitis and gallstones
3.10-3.15	14.05-15.00	9.55-10.40	10.15-10.30	12.30-13.00	13.15	.....	Hypertrophy of prostate
4.30-4.45	22.30-22.50	16.30-16.35	20.00-20.00	.....	.....	.....	Peptic ulcer
6.00-6.00	16.40-17.10	17.00-17.20	17.30-17.50	18.00-18.10	.....	.....	Spermatocele of left testis
5.50-6.00	20.15-20.30	.....	20.10-20.50	19.20-19.55	.....	.....	
6.00-6.00	19.00-19.50	.....	.....	.....	18.10-18.40	.....	Indirect inguinal hernia on right side
5.50-6.00	17.00-17.20	.....	.....	.....	16.10-16.25	.....	Hernia
8.00-8.45	14.30-14.45	.....	12.10-12.40	13.20-14.00	.....	.....	Reducible hernia on right side
5.20-5.40	17.15-17.30	.....	.....	15.15-15.40	.....	.....	Chronic cholecystitis and gallstones
5.10-5.10	17.35-17.50	15.20-15.40	.....	.....	.....	.....	Exploratory laparotomy
5.00-5.10	13.10-13.25	12.00-12.00	.....	.....	.....	.....	Cancer of bladder and acute pyelonephritis
4.40-5.10	11.10-11.40	.....	.....	.....	10.15-10.15	.....	Cancer of rectum with metastases to the liver
	15 Minutes After Heparin Injection	15 Minutes After Injection of Heparin					
4.40-5.00	19.10-19.50	.....	.....	.....	.....	17.40-17.55	Reducible femoral hernia on left side
5.50-6.15	20.10-20.35	.....	16.00-16.40	.....	.....	19.10-19.35	Reducible direct inguinal hernia on right side
5.15-5.15	22.30-23.10	14.00-14.40	.....	.....	.....	.....	Indurated ulcer of duodenum
	25.00-25.50	.....	19.10-19.15	10.00	.....	.....	Inguinal hernia on both sides
	17.00-18.00	13.25-14.10	17.05-17.30	.....	.....	.....	Abscess of abdominal wall
	14.15-15.00	.....	.....	12.10-12.40	.....	.....	Chronic cholecystitis and gallstones
5.40-6.10	17.40-18.45	12.20-12.45	.....	16.10-16.45	.....	.....	Direct inguinal hernia on both sides
4.50-5.15	15.00-15.40	.....	.....	14.10-14.30	.....	.....	Varices of both legs
	16.10	12.15-12.40	.....	.....	.....	.....	Direct inguinal hernia on left side
	26.40-27.10	22.00-23.00	21.00-22.10	.....	.....	.....	Hydrocele of right testis
6.45-7.10	18.25-18.25	.....	.....	17.45-18.00	.....	.....	Reducible indirect inguinal hernia
5.40-6.10	18.30-19.30	16.45-16.45	.....	.....	.....	.....	Stones of right kidney
	19.55-20.15	15.10-16.00	.....	.....	.....	17.15	Stones of left kidney
7.00-7.35	20.05-20.40	18.15-18.15	18.30	.....	.....	.....	Chronic cholecystitis and gallstones
	22.10-22.15	19.10-20.05	.....	.....	.....	.....	Reducible direct inguinal hernia
6.45-7.00	20.10-20.40	17.25-18.00	.....	.....	.....	.....	Acute cholecystitis and gallstones

ology of the Sabbatsbergs Hospital. In this series Wetterdal selected only patients operated on for myoma or for prolapse of the uterus. Eighty-eight such patients have hitherto been regularly treated with heparin postoperatively according to the scheme used in our latest series. There were no complications in Wetterdal's series, in spite of the well known frequency of thrombosis and pulmonary embolism in groups of patients with such disorders. Accidents of this kind occurred in about 4 per cent of his controls.

#### COMMENT

From physiology it is known that heparin is the anticoagulant of the body. The intricate nature of its function has been amply elucidated through the discovery of its formation in the mast cells of Ehrlich in the neighborhood of the blood vessels. Through the extraordinary synthesis of this peculiar kind of polysaccharide nature has provided an excellent anticoagulant, which can be used therapeutically in order to

prevent undesirable formation of clots. The experience hitherto gained also points in this direction.

An observation made by one of us (C. C.) at an early date is of particular interest in this connection. It was found that a larger dose of heparin is rendered inactive in the blood shortly after a surgical operation than is the case with the same patient before the operation. This is a clear expression of the tendency to the formation of clots which cause thromboembolic complications postoperatively. As is evident from table 3, the coagulation time is shorter on the day following operation after a certain dose of heparin than on the day before operation. In three or four days the original state of the blood is restored. It is evident that an auxiliary dose of heparin neutralizes the tendency of the blood to coagulate and greatly facilitates the restora-

tion of the normal state of coagulation. It is against this background that the favorable results of the postoperative treatment with heparin given in this paper are to be considered.

As is evident from the table, the heparinization seems to give a reliable protection against thromboembolic complications postoperatively. It has proved to be particularly valuable in cases in which, in all probability, such complications may be expected. Thus we know of some patients with umbilical hernia and renal calculi who were safely operated on although the surgeons would have refused to operate without the possibility of subsequent heparinization.

In the series of 201 cases in which heparinization was done there occurred no undesirable reactions. Evidently the treatment is quite harmless. In Sweden, at least thirty thousand doses of heparin of 50 to 100 mg. each have been given intravenously without any fatalities or any noteworthy drawbacks. In only 1 case symptoms developed which were of anaphylactic nature.

In animals the product is completely harmless. A dose of 10 mg. per kilogram has been given intravenously to 5 rabbits four times a day over a period of ten days without any influence on the blood picture and without causing detectable pathologic changes in the inner organs.

Less pure preparations of heparin, however, consistently give a rise in temperature and a chill within two hours. The symptoms disappear in one to two hours. This detail necessitated at one time careful checking of every new lot of heparin. There is also an individual hypersensitivity to pyrogenic impurities. Persons unexpectedly reacting after an injection of heparin were given heparin of another lot known to be absolutely free from these foreign pyrogens.

Little is known as to the dose of heparin necessary for the prevention of postoperative thromboembolic complications. We preferred in 1935 to begin with a dose which seemed to us to be sufficiently large. Our choice has proved to be correct. It remains in the future to find out the smallest dose sufficient to eliminate the tendency toward coagulation after surgical operations.

During the course of our experiments we gained the impression that heparinization should not be abruptly cut off. This has been demonstrated in several cases in which there were already existing thrombi. If heparin in such cases is suddenly withdrawn, it is not unusual to find a new pulmonary embolism within ten to fifteen days. The dose of heparin should preferably be decreased successively at the end of the treatment and in cases of existing thrombi be continued for as long a time as possible.

As to the question of the treatment of acute thrombi with heparin, no definite statement can so far be made, because of the unpredictable course of the thromboembolic complications. In our series, all the patients with such complications have been treated with heparin, some of them with a seemingly good result. At our suggestion regular treatment with heparin in somewhat large doses, 100 to 125 mg. three times a day, has been given with excellent results in cases of severe pulmonary embolism with fever and a bad general condition. There is, at any rate, no risk in giving heparin in cases of thromboembolic complications. Apparently the recovery proceeds more quickly if the formation of additional thrombi is counteracted or prevented by means of heparin.

#### SUMMARY

In 325 cases involving postoperative treatment with heparin symptoms of thromboembolic complications did not arise. In a control series of 1,111 similar cases such complications occurred in 9 per cent.

The patients selected were in both series over 35 years of age and submitted to operations on the gastrointestinal tract, the biliary system or the urinary passages or to major operations for hernia and varices.

Reference is made to another series of 88 patients with gynecologic disorders operated on for myoma or prolapsus uteri without any thromboembolic complications. In the control series of 1,054 cases there were complications in 4 per cent.

The heparin used had a strength of about 70 per cent of the pure mucoitin trisulfuric acid. It was given as a 5 per cent sterile solution in intermittent intravenous injections four times a day. The ordinary dose was 50+50+50+100 (or 75+75+75+125) mg. daily, started four hours after the operation. The treatment was continued for five to ten days.

## GIARDIASIS AND ITS TREATMENT

### A CLINICAL STUDY

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In recent years, atabrine (dihydrochloride of methoxychlorodiethyl amino-pentyl amino-acridine) has been described as a specific parasiticide for *Giardia lamblia*. Our clinical experience has substantiated this claim, and we are of the opinion that it is now possible to study the effects of giardiasis on human beings much more accurately than it was before a specific remedy for this parasite was known. Our interest in the subject was stimulated by a meeting of the Pan American Medical Association in 1938, and it was at that time that we first began our investigations. Our purpose in this paper is to review briefly a few pertinent contributions to our knowledge of the subject and to present an analysis of the symptoms in 100 cases of giardiasis and the effect of treatment with atabrine in 46 cases.

#### LITERATURE

*Giardia lamblia*, or *Giardia intestinalis*, is a flagellate of the intestine. Geographically, it has a wide distribution and knows no continental or climatic confines, although its occurrence is reported more frequently in warmer climates. It is widely disseminated through vertebrate hosts; it is found in mammals, reptiles, amphibians, birds and fish. It also has been found in the intestine of nematodes of South America. In the intestinal tract, the trophozoite of *Giardia* is found in decreasing numbers from the pylorus to the cecum. The cysts are more numerous in the stools of infected animals than is the vegetative form.<sup>1</sup> The *Giardia* of animals, according to Armaghian, Véghelyi<sup>2</sup> and others, is a small species distinct from that of man and is not infectious to man. *Giardia lamblia* of the human being is a pear-shaped organism 10 to 20 microns in length and 6 to 10 microns in width. It has a sucker disk on its ventral surface and four flagella. Its cysts are 6 to 7 microns in length; if moist, they can thrive for months outside the human body, but desiccation destroys them.

*Giardia* was discovered in the stools of human beings by Leeuwenhoek in 1681 and later was named after Lambi, who rediscovered it in 1859.<sup>3</sup> The parasite is most abundant in the duodenums of human beings and of animals. In the United States, examination of stools reveals a varying incidence of the parasites. The greatest incidence of infection<sup>2</sup> is among children. Boeck<sup>4</sup> reported that 6.5 per cent of adults and 22 per cent of children are infected. The parasite probably would be found more frequently if it were sought in the secretions obtained by duodenal drainage. It should be emphasized that it is sometimes difficult to obtain an adequate sample of duodenal contents. Frequently the parasites are not found in aspirated material because the material obtained is gastric instead of duodenal.

From the Division of Medicine, Mayo Clinic.

1. Armaghian, Veronica: Biological Studies on the *Giardia* of Rats, *Am. J. Hyg.* 26: 236-258 (Sept.) 1937.

2. Véghelyi, Peter: Giardiasis in Children, *Am. J. Dis. Child.* 56: 1231-1241 (Dec.) 1938.

3. Garrison, F. H.: An Introduction to the History of Medicine, ed. 4, Philadelphia, W. B. Saunders Company, 1929.

4. Boeck, W. C.: Giardiasis in Man: Its Prevalence and Relation to Diarrhea and to Gallbladder Disease, *Arch. Int. Med.* 30: 134-158 (Jan.) 1927.



Boeck emphasized that three specimens that are known to come from the duodenum should be examined before the conclusion is made that parasites are absent.

Clinical articles on the subject of the pathogenicity of *Giardia* usually announce that giardiasis does not produce symptoms. The author of such an article then proceeds to present clinical evidence which demonstrates that *Giardia* produced the symptoms in his series of cases. De Muro<sup>5</sup> commented in a similar vein and reviewed Kennedy and Rosewarne's study of 200 cases in which pure infection with *Giardia* caused diarrhea and then reported his own clinical study of cases dating from 1881. In de Muro's series of 45 cases enteritis was present in 28. There was a discordance in this group between the severity of the general symptoms, such as profound asthenia, depression and apathy, and the slight local symptoms of pain in the colon, meteorism and cramping pain in the stomach. Three of the patients in his series had rectocolitis; they recovered after treatment with atabrine. Fourteen had enterohepatobiliary disease. When erosive duodenitis resulted, the symptoms were similar to those of ulcer; when the hepatic system was invaded, the symptoms

TABLE 1.—Analysis of Symptoms in One Hundred Cases of Giardiasis

Cases	Symptoms	Lesions	
		Type	Cases
60	Diarrhea.....	Ulcer.....	4
		Gallbladder disease.....	1
		Chronic ulcerative colitis..	1
		Sprue.....	1
		Diverticulosis.....	1
41	Pain or distress of abdomen: Upper portion.....	Gallbladder disease.....	5
		Ulcer.....	4
24	Lower portion.....	Ulcer.....	1
		Gallbladder disease.....	1
		Sprue.....	1
34	Nervous symptoms: Asthenia Worry Irritability		
6	Fever.....	Chronic ulcerative colitis..	1
10	Vomiting.....	Ulcer.....	2
		Migraine.....	1

were similar to those of cholangitis, cholecystitis or hepatitis. De Muro quoted divergent opinions as to the ability of *Giardia* to produce inflammatory lesions in these organs. He was of the opinion that the data studied favored the pathogenic actions of *Giardia*.

Lyon and Swalm<sup>6</sup> in a thorough review of the records of 3,200 cases stated that *Giardia* may constitute a contributing factor to a state of disease or dysfunction, particularly disease which involves the biliary tract, duodenum and jejunum. Kraemer and Asher<sup>7</sup> maintained the opposite view after they had studied the records of 31 cases of giardiasis. These authors stated that *Giardia* is a harmless invader of the gastrointestinal tract and that its presence may be disregarded. Despite the varying attitudes as to whether or not *Giardia* is pathogenic, in numerous clinical reports in the literature the symptoms are considered to result from giardial infection.

According to Spears,<sup>8</sup> the most prominent symptoms are pain, nausea, vertigo, vomiting, distention, weakness, diarrhea, constipation and jaundice.

Lyon and Swalm are of the opinion that *Giardia lamblia* by its number alone could cause obstruction of the biliary tract, although these authors stated that they have been unable to trace any authenticated case in which *Giardia* actually invaded the gallbladder or biliary ducts. However, Calder and Rigdon<sup>9</sup> more recently reported that a man aged 57 died as a result of giardiasis. Fever and leukocytosis were accompanied by vomiting of blood and diarrhea; *Giardia lamblia* was present in the vomitus and feces. At necropsy, the wall of the gallbladder was autolyzed; the gallbladder was filled with a brownish black fluid in which masses of *Giardia lamblia* were found.

Véghelyi studied 155 children who were infected with *Giardia lamblia*. Some of them did not have symptoms, but 47 had anorexia, 49 had headache, 33 had attacks of dizziness, 41 had abdominal pain, 19 had bloody stools in which pus was present and 57 had irregular bowel movements. Of the 155, 92 showed no evidence of disease other than giardiasis; the symptoms in this group of patients were definitely relieved by treatment with acetarsone.

Little<sup>10</sup> was of the opinion that vertigo, dryness of the skin, lassitude, weakness and mental depression occasionally may be the result of giardial infection.

From this brief review it is obvious that there is not a clearcut syndrome for giardiasis. The reason for this seems to be that when the organism does act as a pathogenic agent the symptoms that result from the infection are distinctly pleomorphic.

#### ANALYSIS OF CASES

This series consists of 100 cases encountered at the Mayo Clinic in which *Giardia lamblia* was present in the duodenal contents, the feces or both.

Sixty-seven of the patients were males and 33 females. The ages ranged from 2½ to 70 years; only 5 of the patients were less than 14 years of age.

Fifteen patients had organic disease other than giardiasis: Four had duodenal ulcer, 5 had disease of the gallbladder, 3 had chronic ulcerative colitis, 1 had diverticulosis, 1 had sprue and 1 had cirrhosis of the liver.

In 11 cases *Giardia* was an incidental finding. In these cases there were no symptoms which possibly could be attributed to the parasite.

The symptoms encountered in this series are classified according to frequency in table 1, and the incidence of other organic lesions is given. In table 2 the cases are classified according to geographic distribution.

Diarrhea was present in 60 cases, in 8 of which there were other organic lesions. Thus in 52 per cent of cases the only apparent cause of diarrhea was giardiasis. The number of stools a day varied from two to twenty. The stools in all cases were loose and watery. Blood was present only occasionally.

Pain or distress in the upper portion of the abdomen occurred in 41 cases; in 9 of these organic lesions were found. This symptom varied from a sensation of epigastric fullness to a dull epigastric ache. In several cases the pain was localized to the right upper quadrant. Pyrosis and flatulence were frequent complaints.

Pain or distress in the lower portion of the abdomen was present in 24 cases, in 3 of which organic lesions were present. This discomfort manifested itself most

5. de Muro, P.: Clinical Aspects of Giardiasis. *Acta med. Scandinav.* 99: 78-91, 1939.

6. Lyon, B. B. V., and Swalm, W. A.: Giardiasis: Its Frequency, Recognition, Treatment and Certain Clinical Factors. *Am. J. M. Sc.* 170: 348-364 (Sept.) 1925.

7. Kraemer, Manfred, and Asher, Maurice: The Role of *Giardia* in the Duodenum. *M. Rec.* 140: 676-678 (Dec. 19) 1934.

8. Spears, Mary M.: The Role of *Giardia* in Gastrointestinal Symptoms. *Rev. Gastroenterol.* 6: 512-516 (Nov.-Dec.) 1939.

9. Calder, R. M., and Rigdon, H. R.: *Giardia* Infestation of Gallbladder and Intestinal Tract. *Am. J. M. Sc.* 190: 82-88 (July) 1935.

10. Little, A. H.: *Lamblia* (Giardiasis). *New Orleans M. & S. J.* 87: 602-606 (March) 1935.

frequently as a crampy sensation associated with a desire to defecate. The pain usually was generalized over the entire lower portion of the abdomen and was relieved by defecation. Only rarely was a dull ache confined to the right lower quadrant.

Nervous symptoms such as asthenia, irritability and worry were the major complaints of 34 patients. Many of these patients were extremely neurotic and worried over the most trifling problems.

Fever was evident in 6 cases. In 1 of these, chronic ulcerative colitis was present. The fever was intermittent in most cases; the highest temperature recorded was 102 F. Chills were present in 3 cases.

Vomiting was present in 10 cases. Two of the patients had duodenal ulcer and 1 migraine. Vomiting occurred intermittently and was not the chronic type frequently associated with obstruction.

This analysis of symptoms is not intended to portray the idea that in all cases the complaints were the result of giardial infection. Despite the fact that in many of the cases organic lesions could not be found, a statement that the parasite was the sole etiologic agent is not justified. No doubt, some of the complaints were entirely functional. It must be pointed out also that in many cases *Giardia* can be an entirely harmless invader, as demonstrated in this series by the 11 cases in which the organism was discovered incidentally.

The fact must be made clear, however, that in this series of cases diarrhea was present in 60 per cent and abdominal pain in 65 per cent. This is more than coincidence, since in a certain group of cases eradication of the parasite with atabrine resulted in a distinct relief of symptoms.

Despite the occurrence of nervous symptoms, asthenia, irritability and worry in 34 per cent of the cases, these complaints are too universal in almost all forms of illness to attach any special significance to their presence.

It is entirely probable that in rare instances chills and fever may be caused by giardiasis. It is wise to consider this possibility in examination of a patient who has a fever of obscure origin.

#### TREATMENT

Until 1937 satisfactory treatment for giardiasis was not available. In 1931 Banerjee<sup>11</sup> stated that there was not any specific treatment for *Giardia lamblia*. De Paula e Silva<sup>12</sup> stated in 1935 that after several remedies were tried the coincidental symptoms vanished, with disappearance of the parasite, although the irrelevant symptoms remained. The coincidental symptoms were those referable to the biliary system or the duodenum or those produced by a more general intestinal infection. The irrelevant symptoms were more polymorphic.

Brumpt<sup>13</sup> in 1937 reported cures in 80 per cent of his animals. He gave a 1 per cent solution of basic acridine dye by mouth. Galli-Valerio<sup>14</sup> in 1937 used a derivative of acridine, commercially called atabrine, and had prompt and striking results in effecting a cure of giardiasis. Bacigalupo,<sup>15</sup> at a meeting of the Pan American Medical Association in Cuba in 1938, reported

his striking results with atabrine. De Muro<sup>16</sup> in 1939 reported that the oral administration of atabrine was more effective than the intramuscular administration in freeing patients of *Giardia*. He found that the disappearance of the organisms was accompanied by great relief of symptoms. The phenomenal results were received with skepticism until our experience revealed the therapeutic efficiency of the drug in cases of giardiasis.

Recently, Nutter and his collaborators<sup>17</sup> studied 23 cases of giardiasis among human beings. Fourteen of these were studied in detail and the effect of atabrine was noted. These workers were of the opinion that atabrine dihydrochloride was highly effective in eradicating the parasite.

In our series of 100 cases, atabrine was employed in 46. Treatment consisted of 0.1 Gm. (1 tablet) three times a day for five days. Administration of the drug was then discontinued and examination of the stools for the presence of parasites was carried out. In certain cases, the duodenal contents also were examined. It should be pointed out that the parasite rarely is found

TABLE 2.—Geographic Distribution of Cases

Location	Cases	Location	Cases
United States		United States	
Midwest		South	
Illinois	4	Florida	3
Iowa	7	Texas	2
Indiana	6	Mississippi	1
Ohio	10	Louisiana	1
Missouri	4	East	
Michigan	2	New York	3
North Central		District of Columbia	2
South Dakota	3	Total cases from United States	63
North Dakota	3		
West		Foreign	
California	3	Canada	5
Montana	2	South Africa	1
Washington	1	South and Central America	13
Colorado	1	Philippines	1
		Mexico	12
		Puerto Rico	5
		Total cases from foreign countries	37

in the duodenal contents without being present in the stool. In this type of case, as mentioned by Boeck, the importance of adequate duodenal aspiration cannot be overemphasized.

No contraindication to treatment with atabrine was encountered in this series. However, many physicians from Latin American countries, who frequently use atabrine in the treatment of malaria, have communicated with one of us (Hartman), and the consensus indicates that advanced hepatic disease definitely contraindicated the use of the drug.

In our group of 46 cases in which atabrine was used, it was impossible to obtain a follow-up examination of the stool in 11. This leaves only 35 cases in which the effect of atabrine can be evaluated. In all but 1, treatment was successful in eliminating the parasites. Thirteen cases in which the symptoms presumably were attributable to giardiasis are presented in detail.

#### REPORT OF CASES

CASE 1.—A woman aged 30 came to the clinic from the Philippine Islands for examination. She complained primarily of physical exhaustion, which was attributed to an environmental neurosis. This manifested itself in various ways, the

11. Banerjee, K. C.: A Case of Lamblasis, *Indian M. Gaz.* 66: 678 (Dec.) 1931.

12. de Paula e Silva, G. S.: A Clinical Review of Giardiasis: Twenty-Two Cases Observed During Study of Five Hundred and Seventy-Two Private Patients, *Am. J. Digest. Dis. & Nutrition* 2: 350-353 (Aug.) 1935.

13. Brumpt, Lucien: Traitement expérimental de la lamblase, *Compt. rend. Soc. de biol.* 124: 1040-1042, 1937.

14. Galli-Valerio, B.: La lamblase et son traitement par l'atébriane, *Schweiz. med. Wchnschr.* 67: 1181-1182 (Dec. 11) 1937.

15. Bacigalupo: Personal communication to the authors.

16. de Muro, P.: Atebrinbehandlung bei Giardiasis (Lamblasis), *Deutsche med. Wchnschr.* 65: 262-263 (Feb. 17) 1939.

17. Nutter, P. B.; Rodaniche, Enid C., and Palmer, W. L.: *Giardia Lamblia* Infection in Man, *J. A. M. A.* 116: 1631-1632 (April 12) 1941.

most important of which was hyperhidrosis. The patient also complained that for many years epigastric pain had occurred soon after meals, associated with much bloating, belching and constipation. This is not the sequence of symptoms produced by ulcer. Massive infection with *Giardia* was found in the stools; because of negative results of laboratory studies, including roentgenograms of the gallbladder, stomach and duodenum, a course of 15 tablets of atabrine (0.1 Gm. each) was given. The patient stated that the abdominal symptoms disappeared after administration of the second tablet. At the end of the fifth day, examination of the stool failed to reveal parasites. Eight days later the patient was still free of symptoms. No subsequent report is available.

CASE 2.—A woman aged 40 who came from Peru gave as her chief complaint epigastric pain which occurred after meals, with much gas and bloating of two years' duration. Diarrhea had alternated with constipation. She was emotionally unstable and had attacks of depression, tachycardia and migraine. *Giardia lamblia* was found in the stools. Duodenal drainage was refused. After the eighth dose of atabrine, the patient maintained that all the abdominal complaints had disappeared as well as the irrelevant symptoms referable to the central nervous system. The patient returned to the clinic six months later and stated that she had continued to feel well and that she did not have a complaint of any kind.

CASE 3.—A man from Mexico aged 35 registered at the clinic. He complained of chronic recurring diarrhea of five years' duration associated with nausea, vomiting and much bloating. A diagnosis of duodenal ulcer was made on roentgenologic examination, for which medical treatment was instituted. The patient suffered from emotional instability which was attributed to environment. *Giardia* had been found in the stools in Mexico and in the duodenal contents at the clinic. A course of 15 tablets of atabrine was instituted. On the second day of treatment there was considerable relief of the abdominal cramps that were associated with the diarrhea; the latter complaint disappeared several days later. *Giardia* was not found in the duodenal contents eight days after institution of treatment. Stools were not examined. Thirteen months after treatment the patient reported perfect health without limitations of any kind, including diet. He had gained 16 pounds (7.3 Kg.).

CASE 4.—A woman aged 39 who came to the clinic from Peru gave as her chief complaint a twenty-year history of epigastric distress which would occur two hours after meals. The distress had been relieved by food and sodium bicarbonate. A sensation of fulness in the upper portion of the abdomen and occasional attacks of vomiting were associated with this distress.

The patient did not have any systemic organic disease except uterine fibroids, but *Giardia* organisms were present in the stools. Hysterectomy was performed. A course of 15 tablets of atabrine was given and on examination of the stool and duodenal contents seventeen days later parasites were absent. The symptoms referable to the gastrointestinal tract disappeared after treatment of the giardiasis. A report forty-eight days later revealed that the patient was in excellent health and did not have a complaint of any kind.

CASE 5.—A man from Mexico aged 36 registered at the clinic and gave as his chief complaint much gas and belching which would begin fifteen minutes after meals and would last for an hour. This distress was temporary and was eased by additional food. The condition had existed for eight years. The patient had acute diarrhea and frequent headaches. *Giardia lamblia* was found in the stools. A course of 15 tablets of atabrine was given, with the result that seven days later the stools failed to reveal the presence of parasites. The diarrhea and belching were much less severe; the patient stated that his stomach felt normal. He gave the same report ten days after cessation of treatment, and a letter received more than five months later reported that he had continued in good health.

CASE 6.—A man from Indiana aged 37 came to the clinic primarily because of early essential hypertension. He had mild

diarrhea but no other gastrointestinal complaint. *Giardia lamblia* was found in the duodenal contents and in the stool. A course of 15 tablets of atabrine was given, which resulted in disappearance of *Giardia* from the stools. Reexamination by duodenal drainage was refused. The patient stated that after the treatment, the diarrhea had disappeared completely and that he felt much improved. He was reexamined at the clinic about four months after treatment and still felt well, with no return of his former complaint.

CASE 7.—A woman from Mexico aged 32 came to the clinic and gave a seven year history of constipation and attacks of acute epigastric pain which had been more severe in the two years prior to registration. Recently the patient had noticed a sharp pain which had extended from the right costal margin to the right scapula. A diagnosis of cholecystitis had been made by the physician in her home locality and cholecystectomy had been advised.

The patient was nervous, introspective and suffered from migraine. Examination of the duodenal contents at the clinic revealed the presence of *Giardia lamblia*. A course of 15 tablets of atabrine was given and *Giardia* disappeared from the duodenal contents. The stools were not examined. The patient stated that after treatment all symptoms disappeared and that she slept without pain for the first time in months. Six days later she was still free from all symptoms, and in a letter seven months after treatment she stated that she was feeling well and that her previous symptoms had not returned.

CASE 8.—A man aged 50 who came to the clinic from Salvador, Central America, on Dec. 28, 1939 complained of fever associated with nausea after eating, severe pain in the right upper quadrant of the abdomen and loss of 45 pounds (20.4 Kg.). In 1937 he had had attacks of high fever after gormandizing. This fever lasted only a few hours. In August 1939, paresthesias of tingling and a sensation of stiffness developed in the inner aspect of the right knee and along the distribution of the right ulnar nerve. When his body was horizontal he had a pain along the lateral surface of the right twelfth rib. These symptoms had been treated at home by vitamin therapy with indifferent results. In November the patient began to have severe chills and fever, the temperature reaching 103.6 F. every fourth day. The neuritis became more severe. Sulfanilamide was tried without resultant improvement; frequent washing of the nasal sinuses also failed. Dyspnea, tachycardia and even delirium had ensued. Injections of arsphenamine had controlled the peaks of fever.

However, a new type of fever followed. The patient had begun to have daily attacks of low grade fever from 11 a. m. to midnight. These attacks had their onset early in December and continued after his arrival at the clinic. The patient was extremely debilitated and transportation was possible only in a wheel chair. Careful search for the presence of malaria, typhoid and paratyphoid was carried out. Results of agglutination tests for *Brucella* had given negative results in the hospitals of Salvador and Guatemala.

On examination at the clinic, the patient was pale, weak and thin; his systolic blood pressure, measured in millimeters of mercury, varied from 138 to 174; his diastolic, from 87 to 114. Examination of the ocular fundi disclosed arteriosclerosis grade 2 (on a basis of 1 to 4). His pulse rate varied from 102 to 120. He had daily elevations of temperature to 100 to 101 F. late in the afternoon. Urinalysis revealed pyuria grade 4, which later was found to be the result of mild prostatitis. Intravenous pyelography failed to visualize the left kidney. Culture of the urine revealed a green-producing streptococcus. The concentration of urea was 20 mg. per hundred cubic centimeters of blood. The value for hemoglobin was 9.6 Gm. per hundred cubic centimeters of whole blood, erythrocytes numbered 4,690,000 and the leukocytes varied between 10,400 and 15,700 per cubic millimeter of blood. The differential count was normal. Smears of the blood were not diagnostic of any toxic state. Plasmodia were not found. Results of the Kline, Kahn, Hinton and Kolmer tests were negative. The sedimentation rate of erythrocytes was 82 mm. an

hour. Bromsulphalein tests for liver function revealed retention of dye, grade 1. Results of agglutination tests for Brucella, typhoid and paratyphoid were negative. Blood cultures were negative. Roentgenograms of the frontal sinuses revealed thickened membranes, but on investigation active infection was not discernible. A roentgenogram of the thorax revealed nothing abnormal.

*Giardia lamblia* was found in the stool and in the duodenal contents. On Jan. 3, 1940 a course of 15 tablets of atabrine was instituted. On January 5 the patient reported that he felt much better, was more alert, was less fatigued, was eating well and did not have nausea. His temperature was normal then and subsequently. This was five days after institution of treatment with atabrine without other form of treatment. On January 9 duodenal drainage failed to reveal the presence of *Giardia*. On January 10 medication was prescribed for the deficiency of hemoglobin. By this time the patient had abandoned his wheel chair. By January 16 he had gained 4½ pounds (2 Kg.) and was able to walk several blocks to the dentist and spend two and a half hours in the dentist's chair for the treatment of several septic teeth. He still complained of some neuritic pains. The sedimentation rate on January 15 was still elevated to 91 mm. an hour.

On dismissal forty-one days after institution of treatment, the patient was in good health in spite of secondary anemia. The value for hemoglobin was 9.4 Gm. Erythrocytes numbered 3,830,000. A bromsulphalein test of liver function still indicated a retention of dye, grade 1. Cystoscopic examination did not reveal any abnormality on the right side, but the left ureteral orifice was not visualized and there was no excretion of indigo carmine from the left kidney. Because of the results of the previous intravenous pyelogram and the cystoscopic study, a diagnosis of asymptomatic functionless left kidney was made. The patient's appetite was excellent and he had gained 21 pounds (9.5 Kg.). All symptoms disappeared; he was dismissed with instructions to return if any further symptoms developed. A year later the patient returned to the clinic for further examination of the renal condition, but he had been free of symptoms since his previous visit. Frequent examinations of the stools by the physician in his home locality had never revealed the presence of *Giardia*.

CASE 9.—A man from Iowa aged 23 came to the clinic stating that a week prior to registration he had ingested an orange and a soft drink in the early evening and soon after this had had an aching pain in the lower portion of the abdomen. The next morning diarrhea developed which consisted of six to seven loose, watery stools during the day. Pain in the lower portion of the abdomen continued. The diarrhea persisted for a week; during this time the patient passed ten to twelve stools daily but no blood was visible. The patient had eaten little food because eating seemed to increase the abdominal discomfort.

Results of general examination were negative. Proctoscopic examination revealed no abnormalities, but *Giardia lamblia* was found in the stool. The sedimentation rate was 54 mm. an hour and the blood count was normal. A course of atabrine was instituted and the patient was much improved the next day. He continued to improve, and five days after institution of treatment parasites were not found in the stool. The diarrhea was completely relieved. On dismissal, the patient felt well; no further report is available.

CASE 10.—A man from Brazil aged 21 came to the clinic because of a dull, burning pain across the upper portion of the abdomen. This discomfort appeared approximately four hours after meals and was not relieved noticeably by food. The patient stated that he had a feeling of fullness in the epigastrium with much gas in the lower part of the bowel after eating. The patient always felt tired and was unable to sleep well. He was nervous and introspective.

Roentgenographic studies on the gastrointestinal tract and laboratory examinations revealed nothing abnormal except for the presence of *Giardia* in the stool and duodenal contents. The patient stated that *Giardia* frequently had been found in his stool in South America. He was given a course of atabrine

consisting of 15 tablets; three days after finishing the course of medication the patient stated that he was almost relieved of all symptoms. A report from the patient one year later stated that he continued to enjoy good health.

CASE 11.—A woman aged 35 who came to the clinic from Colombia complained of attacks of diarrhea for a year and a half. These attacks appeared every one to two months and lasted for six to seven days. During the attacks, the patient had some generalized pain in the lower portion of the abdomen with a moderate amount of gaseous distention. Blood had never been present in the stool and the patient had not lost weight.

Results of general examination were negative; a roentgenogram of the colon did not reveal any abnormality. *Giardia* was present in the stool and duodenal contents. The patient was given a course of atabrine; this medication resulted in disappearance of the parasites from the feces. Reexamination of the duodenal contents was refused. The patient was dismissed from the clinic three days after examination of the stool was negative for parasites. The diarrhea was improved significantly. A letter from the patient six months later revealed that she was enjoying good health and that her former troublesome complaints had not returned.

CASE 12.—A man aged 41 came to the clinic from Puerto Rico for investigation of stomach trouble. The patient stated that his bowels had always been constipated, but during the four months prior to registration he had noted a dull epigastric pain, occasionally awakening him at night. This distress always was relieved by food or milk.

Roentgenographic examinations of the stomach and gall-bladder gave negative results, but *Giardia* was present in the stool. The patient was given the usual course of 15 tablets of atabrine and seven days later examination of the stool did not reveal any parasites. He immediately began to feel better but complained of nervousness. He was given phenobarbital and an anticonstipation diet. He stayed under observation for almost a month, and when he left the clinic his health was much improved. In a letter four months later the patient stated that he had continued to enjoy good health after his dismissal from the clinic.

CASE 13.—A man aged 38 came to the clinic from Puerto Rico for a general examination. His only complaints were plantar warts and a slight feeling of epigastric fullness after eating and some sour eructations. This condition was always aggravated after indiscretions in regard to food.

General examination gave negative results. Roentgenologic and gastroscopic examinations revealed no abnormalities of the stomach. The stools contained *Giardia*, however, and he was given a course of 15 tablets of atabrine. On completion of medication the stools were free of parasites. At the time of dismissal from the clinic the patient's epigastric distress had disappeared; in a letter seven months later he stated that he was continuing to enjoy good health.

#### SUMMARY AND CONCLUSIONS

Of 100 cases of *Giardia lamblia* encountered at the clinic treatment with atabrine was employed in 46. Follow-up examinations of the stools were obtained in 35 cases. The results of our treatment with atabrine reported in this paper are based on these 35 cases only. In this group all the patients but 1 were freed of parasites on treatment with atabrine. This means that in these cases the drug was 97 per cent efficient in eradicating *Giardia* from the intestinal tract. Because atabrine may be considered a specific remedy for giardiasis, much progress may be expected in the study of the pathogenicity of *Giardia*. That the parasite was probably the true etiologic factor in the thirteen cases reported in detail is substantiated by the fact that removal of parasites by the use of atabrine completely relieved each patient of symptoms for a significant period.

# CLASSIFICATION OF PRIMARY ENCEPHALITIDES OF MAN ACCORDING TO VIRUS ETIOLOGY

PRESENT STATUS

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The term primary encephalitis is applied to cases of inflammation of the brain not accompanied by physical or chemical injury, bacterial or parasitic infection or tumor. These cases present evidence of the presence of an agent which affects primarily and directly the brain tissue—fever, lymphocytes in the spinal fluid, clinical signs indicating involvement of brain cells and, at autopsy, mononuclear, polymorphonuclear and neuroglial cells beneath the meninges, about the blood vessels and surrounding necrotic nerve cells. Further clinical classification has proved difficult.

Recently, advances have been made in grouping these conditions according to the virus causing them. By 1881 rabies was proved to be due to a virus which attacked chiefly nerve tissue; in 1909 poliomyelitis was shown to be due to a virus with a special predilection for the spinal cord and brain. In 1917 a summer epidemic of disease of the central nervous system among children in Australia, X disease, was found to be associated with a virus which acted chiefly on nervous tissue. During the same year, another form of encephalitis made its appearance in Europe and spread widely. Its clinical and pathologic features were described by von Economo but no etiologic agent was then or has since been isolated. In the summer of 1933 an epidemic of encephalitis centering in St. Louis was proved to be due to a type of virus acting on the central nervous system. In 1936 a summer encephalitis, type B, occurred in Japan and was found to be caused by a virus closely resembling the St. Louis virus. In 1938 the so-called equine encephalomyelitic viruses were shown to be capable of producing encephalitis in man. Furthermore, the virus of louping ill of sheep, the virus of lymphocytic choriomeningitis, presumably of mice, and the B virus, supposedly of monkeys, have all proved capable of causing encephalitis in man. At present, therefore, nine forms of primary encephalitis have been proved to be due to viruses with affinity more or less for the central nervous system; one additional clinical form, that of von Economo, has failed to elicit a recognizable agent, and other indefinite forms, which are undoubtedly numerous, remain etiologically undefined.

The striking features of each of these virus encephalitides are summarized in the accompanying table.

## CLASSIFICATION

Rabies, caused essentially by an animal virus, transmitted to man by a bite, may occur in any one at any time. A definite diagnosis is entirely practical but must await postmortem examination of tissues for the presence of typical Negri bodies in the large nerve cells of the hippocampus or the demonstration of virus by inoculation of brain tissue into animals, preferably mice. The virus is confined to the central nervous system, peripheral nerves, salivary glands and, occasionally, adrenals. It is virulent for all species of animals tested.

Poliomyelitis is unknown in any host other than man and its mode of transmission is unknown; it occurs

usually in the summer months in children. A clinical diagnosis is uncertain in the absence of paralysis of a typical lower motor neuron type. A definite diagnosis must await postmortem examination of tissue for the presence of characteristic necrosis of anterior horn cells, accompanying hemorrhage, perivascular reactions, mononuclear and neuroglial cell infiltrations and neuronophagia. The most critical evidence accrues from the demonstration in nerve tissue alone of a virus which is pathogenic chiefly for monkeys. Such a critical diagnosis is laborious, expensive and impractical. The virus is confined to the nerve tissue of the host but may be found occasionally in the nasal washings of patients and contacts, as well as in the stools of patients and contacts, and in sewage.

St. Louis encephalitis is likewise unknown in hosts other than man and its mode of transmission is unknown. The disease has centered thus far in the Midwest and has occurred in the summer months, chiefly in adults. A clinical diagnosis solely on the basis of signs and symptoms is hazardous but can be established definitely by serologic tests on the patient's blood. Specific neutralizing antibodies appear in most cases within two weeks, and a search is now being made for specific complement fixing antibodies. The test for neutralizing antibodies is practical only in those laboratories in which many viruses are being actively maintained and in which neutralization tests are being run as a routine; the complement fixation test is simple to perform and is practical in any laboratory. The few patients tested for fixation of complement have given positive results at two years and negative ones at seven years. At autopsy the lesions are not specific, but diagnosis is readily established by the demonstration of virus in the brain tissue by inoculating it intracerebrally into mice. The virus is present only in brain tissue. It is highly virulent for mice and slightly so for monkeys.

Japanese B encephalitis, a close counterpart of St. Louis encephalitis, may well have animal reservoirs and be transmitted by insects. It has been found thus far only in Japan and is indistinguishable epidemiologically and clinically from St. Louis encephalitis. Sheep, horses and other animals have been shown to possess specific neutralizing antibodies in their serums, and mosquitoes have proved capable of transmitting the disease under conditions of experimental infection and transmission. As in the case of St. Louis encephalitis, a clinical diagnosis cannot be made definitely from the signs and symptoms but the blood of convalescents does contain specific neutralizing antibodies and, presumably, complement fixing antibodies. The diagnosis can be readily established not only in the patient but at autopsy as well, not by examination of tissues, for these show no lesions specific to this virus, but by isolation of the virus from brain tissue by intracerebral inoculation of mice. The virus is highly virulent not only for mice but for monkeys and sheep, and in these larger animals it causes much destruction of the Purkinje cells of the cerebellum. It is serologically distinguishable from the virus of St. Louis encephalitis.

Louping ill appears to be essentially a primary encephalitis of sheep in Scotland and has not been known to be transmitted to man in nature. The disease is conveyed by insects and is caused by a virus indistinguishable from the virus of Japanese B encephalitis except for the neutralization and the complement fixing antibodies, which are specific. This virus gave rise



to encephalitis in 3 laboratory workers in this country in whom specific neutralizing and complement fixing antibodies developed, which, in 2 patients recently tested, have persisted for eight years.

X disease, known only in man and unknown as to its mode of spread, has been recognized only in Australia. It occurred there in the summer months of 1917 and 1918 and again in 1925 in children, in the form of encephalitis. Postmortem examination of brain tissue disclosed extensive involvement of the Purkinje cells. From the brain tissue a virus was recovered which was virulent for monkeys and for sheep. Unfortunately this virus was not preserved; hence further information is lacking.

Especially noteworthy here is the close relation between the viruses of the Japanese B encephalitis,

Lymphocytic choriomeningitis is probably a disease of mice which is transmitted to man in some unknown manner. Man is subject to it at any time and at any age. The virus can often be recovered from the blood or spinal fluid of the patient and complement fixing antibodies appear early and disappear early, while neutralizing antibodies appear late and persist. The infection has not proved fatal to man, hence the distribution of the virus is known only in animals. Animals show few lesions besides accumulations of lymphoid cells in the meninges and choroid plexus. The virus is virulent for mice, monkeys and guinea pigs.

"B" virus is probably native to monkeys. In 1932 it was transmitted to a laboratory worker through the bite of a monkey and, following the development of an ascending myelitis, proved fatal. The virus was

*Classification of Primary Encephalitides of Man According to Virus Etiology*

Name	Occurrence	Clinical Diagnosis: Presence of		Postmortem Diagnosis: Presence of		Response of Animals to Experimental Inoculation of Virus						Reservoir Animals	Trans- mission Bite	
		Trans- missible Agent	Antibodies	Specific Lesions (Central Nervous System)	Trans- missible Agent	Mon- key	Rab- bit	Gui- nea Pig	Sheep	Rat				
			Com- ple- ment Fix- ing								Neu- tral- izing			
Rabies.....	Any time; any one	.....	..	..	Negri bodies	Virus (1881): C.N.S. (salivary glands, adrenals)	+	+	+	+	+	+		
Poliomyelitis.....	Summer; children	Nasal pas- sages, stools	..	..	Anterior horn cell degenera- tion	Virus (1909): C.N.S.	0	+	0	0	0	±	?	?
St. Louis enceph- alitis	Summer; any one	.....	+	+	.....	Virus (1933): C.N.S.	+	±	0	0	0	0	?	?
Japanese B en- cephalitis	Summer; any one	.....	(+)	+	Purkinje cell degeneration	Virus (1936): C.N.S.	+	+	0	0	+	0	Animals ?	Insect ?
Louping ill.....	Laboratory	.....	+	+	Purkinje cell degeneration	.....	+	+	0	0	+	0	Sheep	Insect
X disease.....	Summer; children	.....	..	..	Purkinje cell degeneration	Virus (1917): C.N.S.	?	+	0	0	+	0	?	?
Equine encephalo- myelitis	Summer; any one	.....	+	+	.....	Virus (1938): C.N.S.	+	+	+	+	±	+	Horse ? Birds ?	Insect ?
Lymphocytic choriomeningitis	Any time; any one	Cerebrospinal fluid (1934), blood	+	+	.....	.....	+	+	0	+	?	±	Mouse	?
"B".....	Laboratory	.....	..	..	.....	Virus (1932): widespread	±	+	+	+	?	?	Monkey ?	?

louping ill and X disease and the similarity in the epidemiology of diseases caused by these and the St. Louis viruses.

Equine encephalomyelitis is essentially a disease of horses rather than of man. The causative virus gains entry to the body from some reservoir, possibly birds, and possibly through the bite of an insect. From the portal of entry it makes its way directly to the brain, where it incites inflammatory reactions and damages brain cells. Recently this virus has been found to infect man. In the summer of 1938 an outbreak of the disease occurred among children in Massachusetts and since then other outbreaks have been recognized among adults. An accurate clinical diagnosis can be made by the demonstration of neutralizing or complement fixing antibodies in a patient's serum two weeks or more after infection. Both types of antibody persist for two years at least. At autopsy lesions are not specific, but a diagnosis can be made by the demonstration of virus through intracerebral inoculation of mice with brain tissue. The virus is virulent for mice, monkeys, rabbits, guinea pigs, rats and sheep. At least two serologic types of virus are known—Eastern and Western. Generally, the Eastern strain is more pathogenic for man and animals.

found widespread throughout the tissues and subsequently proved virulent for monkeys, rabbits and guinea pigs.

Herpes encephalitis has not been included in the foregoing table since the ability of herpes virus to produce encephalitis in man is in dispute.

Von Economo encephalitis has been omitted from the table because no specific agent has yet been recovered.

SUMMARY

From the large and diverse group of so-called primary encephalitides, nine types have thus far been shown to be due to viruses with a special predilection for the central nervous system. At least six of them appear to be of animal origin and at least three are probably transmitted by insects. Clinical diagnoses can be established readily and practically in all, except rabies and poliomyelitis, by the demonstration of neutralizing and, probably, complement fixing antibodies in the serums of patients. The postmortem diagnosis is best established through isolation and identification of the virus, which, in most instances with the exception of poliomyelitis, are entirely practical procedures.

Sixty-Sixth Street and York Avenue.

# THE TEMPOROMANDIBULAR JOINT IN RHEUMATOID ARTHRITIS

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AND

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The dental and medical professions have been interested simultaneously in the patient with rheumatoid arthritis only when a focus of infection in the mouth is thought to have an influence on the patient's systemic disease.<sup>1</sup> However, the treatment of involvement of the temporomandibular joint in rheumatoid arthritis is another condition which requires the intelligent cooperation of the dentist and the physician as involvement occurs in more than one half of patients with this disease. The dentist who encounters patients in his practice with ill defined syndromes of "facial neuralgia" or "stiffness of the jaw" must consider the possibility of these symptoms being early prodromes of rheumatoid arthritis. The physician treating rheumatoid arthritis should understand the anatomy, pathology and treatment and be able to give the proper prognosis in this condition, as the patient with the temporomandibular joint involved is apprehensive and fears eventual complete limitation of motion, as may occur in other joints.

For thirteen years, one of us (L. A. R.) has been attending dentist to an institution devoted to the diagnosis, treatment and outpatient care of the chronic arthritides. During this time we have been particularly interested in the subject of this paper, and we draw our material from long-continued personal observation and care of a large group of patients with rheumatoid arthritis.

In the past, attention has been directed to the temporomandibular joint when it was affected by acute and chronic infections, involving the joint itself or surrounding structures, which might lead to complete limitation of motion. Tumors and trauma may lead to the same end.<sup>2</sup>

Pathologic processes in the temporomandibular joint resulting from malocclusion may simulate many neurologic and otologic disorders. Costen<sup>3</sup> and others<sup>4</sup> have shown that otic symptoms predominate in patients with edentulous mouths and that symptoms of pain are most common in patients with natural malocclusion or malocclusion from loss of molar support on one side. Each decade produces a greater predisposal to these symptoms as the wear on the natural teeth or loss of them increases wear and tear on the temporomandibular joint. The majority of Costen's patients were over 40. The symptoms or signs referable to the ear resulting from malocclusion are local stuffiness, impaired hearing, herpes, tinnitus and dull pain. Symptoms consisting of headache; pain in a sinus; burning sensation in the throat, tongue and side of the nose; rarely decreased or increased saliva;

herpes of the buccal mucosa, and trismus<sup>5</sup> have also been described as resulting from malocclusion.

Despite the fact that temporomandibular symptoms and even partial or considerable limitation of motion of this joint occur in persons with rheumatoid arthritis, the subject has received scant attention in dental and medical literature. In 1764 Baron Haller<sup>6</sup> in *Elementa Physiologiae* described erosion of the cartilage and twenty small bodies (glebulae) in the temporomandibular joint. Kazanjian<sup>7</sup> has reported 3 cases of bilateral "complete ankylosis" occurring in rheumatoid arthritis. Buchman<sup>8</sup> recently surveyed the temporomandibular joint from the orthopedic surgeon's point of view and stated that it is not at all uncommon for this joint to be involved in rheumatoid arthritis. He reported 1 case but apparently has had experience with many. Riesner<sup>9</sup> illustrated faulty temporomandibular articulation by roentgenographic examinations of this joint in 1 patient with rheumatoid arthritis. Aside from these individual reports, the subject has not been considered carefully so far as we are able to ascertain.

The temporomandibular joint is ginglymoarthrodial (hinge-sliding) in character (fig. 1). The head of the condyle of the mandible moves against the glenoid fossa and the articular eminence of the temporal bone. These two joint surfaces are separated by a complete fibrocartilaginous disk, which is a thin oval plate whose

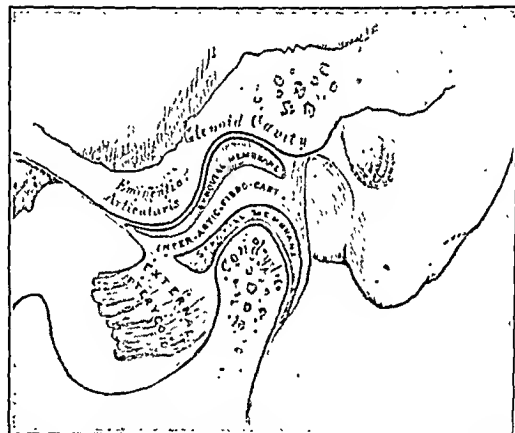


Fig. 1 (from Gray's Anatomy).—Vertical section of temporomandibular articulation.

upper surface is concavoconvex from before backward, to accommodate itself to the mandibular fossa and the articular tubercle, while its under surface, in contact with the condyle, is concave. This disk is attached at its circumference to the articular capsule and with the latter divides the joint space into two separate synovial spaces, the upper being larger and looser. The mandible may be depressed, elevated or carried forward or backward, and a slight amount of side to side motion is permitted. In slight opening of the jaw the lower of the two joints is used. When the mouth is more widely opened, the lower joint still acts on a hinge and the upper joint has a gliding motion, the disk and

From the Robert Breck Brigham Hospital.

1. Hench, P. S.: The Treatment of Dental Foci in Chronic Rheumatic Disease, *Dental Survey* 6:19 (June) 1930.

2. ... and Darciassac, M.: Notes sur cent cas d'ankylose Bull. et mêm. Soc. d. chirurgiens de Paris 27: Federspiel, M. N.: Incomplete and Complete Jaw

Ankylosis, *J. Am. Dent. A.* 26:585 (April) 1939. Kazanjian.

3. Costen, J. B.: Neuralgias and Ear Symptoms Associated with Disturbed Function of the Temporomandibular Joint, *J. A. M. A.* 107:252 (July 25) 1936.

4. Goodfriend, D. J.: Abnormalities of the Mandibular Articulation, *J. Am. Dent. A.* 21:204 (Feb.) 1934. Chor, H.: Neurologic Aspects of Temporomandibular Disorders, *J. Am. Dent. A.* 25:1033 (July) 1938.

5. Costen, J. B.: The Mechanism of Trismus and Its Occurrence in Mandibular Joint Dysfunction, *Ann. Otol., Rhin. & Laryng.* 48:499 (June) 1939.

6. Haller, cited by Jones, R. L.: *Arthritis Deformans*, New York, William Wood & Company, 1909, p. 9.

7. Kazanjian, V. H.: Ankylosis of the Temporomandibular Joint, *Surg., Gynec. & Obst.* 67:333 (Sept.) 1938.

8. Buchman, J.: Lesions of the Temporomandibular Joint, *Am. J. Orthodontics* 25:355 (April) 1939.

9. Riesner, S. E.: Temporomandibular Articulation: Its Consideration in Orthodontic Diagnosis, *Internat. J. Orthodontia* 22:1 (Jan.) 1936.

condyle sliding forward on to the articular tubercle, and simultaneously the condyle revolves on the disk. In grinding or chewing one condyle and its disk moves forward and the others backward and, in addition, the condyle undergoes vertical rotation on the disk. The joint is supported by the temporomandibular (external lateral) and the sphenomandibular (internal lateral) ligaments, while the stylomandibular ligament is an



Fig. 2.—Plaster collar used to prevent subluxation of the mandible.

important accessory to the joint. The nerves of the temporomandibular joint are the auriculotemporal and masseteric branches of the mandibular nerve.<sup>10</sup> The anatomic features of this joint have been presented in such detail because the presence of the combination of both a sliding hinge motion and a complete interarticular disk differentiates this joint from all others usually involved in rheumatoid arthritis.

The course of the pathologic process in this joint is no different from others involved in rheumatoid arthritis so far as we know. The clinical, roentgenographic or postmortem study is difficult, however, because of its anatomic location. Periarticular edema or thickening or hydrarthrosis can be palpated only with difficulty. Generalized osteoporosis in this disease and superimposition of the joint on the skull make roentgenographic study of less than usual value. Permission for postmortem study is seldom obtained, for esthetic reasons. However, the clinical signs, symptoms and course point to a pathologic sequence similar to that found in other joints. Synovitis is probably the most important primary pathologic change. Then proliferation of the synovium, periarticular edema and hydrarthrosis may follow and produce local pain, tenderness, swelling and irritative phenomena in the supply of nerves to the synovium. The interarticular fibrocartilaginous disk has no nerve supply<sup>11</sup> and cannot produce referred pain, but it is intimately associated with the symptoms and eventual prognosis of rheumatoid arthritic involvement of this joint. While it is usual to have limitation of motion subsequent to panus formation and obliteration of the joint cavity, complete limitation of motion, or ankylosis, has not been observed in our series of 515 patients. The writings of others<sup>12</sup> would confirm this fact. We ascribe this to the interposition of the disk. However, in certain persons, when there is a lack of molar support or normal occlusive balance, the disk is perforated or completely destroyed by the upward pull of the masseter muscles on the mandible,<sup>9</sup> and if this sequence of events occurs before the onset of rheumatoid

arthritis then bony ankylosis can be expected. It is, however, unlikely, as these degenerative changes in the disk usually occur at a time of life late for the onset of rheumatoid arthritis.

Unfortunately the term ankylosis has been widely used to mean both limitation of motion and immobility. We feel that only its correct definition should be retained, and in this paper ankylosis has been used to indicate absolute immobility or complete limitation of motion. Our patients are divided into two groups, those with partial and those with considerable limitation of motion. Partial limitation of motion implies more than 5 mm. of opening power and considerably less than 5 mm. Even our patients with most severe arthritis have shown some motion, however slight. Kazanjian<sup>7</sup> reported 3 cases of "complete ankylosis" after rheumatoid arthritis, but he defined "complete ankylosis" as less than 5 mm. of opening power. We feel that this precludes actual bony ankylosis, because in other joints this would cause loss of motion.

Limitation of motion of the temporomandibular joint in patients under 15 leads to deformity of the jaw through hypoplasia of the mandible. Hypoplasia has been explained by three factors; first, the diseased joint directly affects an important center of growth in the condyle; second, lack of proper function leads to hypoplasia,<sup>7</sup> and, third, the dental literature has stressed the effects on mandibular growth of misplaced and unused teeth in the young.<sup>13</sup>

In older patients, rheumatoid arthritis of this joint may lead to subluxation which, when severe, may cause the mandible to recede as much as 1 inch (2.5 cm.). This is probably due basically to intrinsic pathologic changes in the joint itself and to the generalized muscular atony and atrophy associated with the pathologic process. The pull of gravity plays an important part in patients confined to bed, as we have observed subluxation to be most severe in patients kept in the supine position. The integrity of the temporomandibular joint is also threatened by the loss of normal occlusion which



Fig. 3.—The collar as used in the supine position to press against the angle of the mandible.

is brought about by the necessary or unnecessary extraction of teeth.<sup>14</sup> It is well known that the loss of a single tooth can distort the temporomandibular articulation,<sup>9</sup> and this fact may contribute to subluxation.

In order to clarify the pathologic sequence and clinical observations and coordinate them with the patient's symptoms and proper treatment, persons with rheumatoid arthritis with temporomandibular involvement

10. Gray, H.: *The Anatomy of the Human Body*, revised and re-edited by W. H. Lewis, ed. 23, Philadelphia, Lea & Febiger, 1936, p. 289.

11. Pemberton, R., and Osgood, R. B.: *The Medical and Orthopedic Management of Chronic Arthritis*, New York, The Macmillan Company, 1934, p. 44.

12. Kazanjian, J. Buchman.<sup>3</sup>

13. Dunn, R.: *The Mandible and Its Post-Natal Development*, J. Am. Dent. A. 24:529 (April) 1937.

14. Reimann, H. A., and Havens, W. P.: Focal Infection and Systemic Disease, J. A. M. A. 114:1 (Jan. 6) 1940.

may be divided into three groups—those with transitory, acute and chronic arthritis (table 1).

We have found the transitory type of involvement of the temporomandibular joint to be present in 8 per cent of persons with rheumatoid arthritis. It is found in slightly or moderately diseased patients and would

TABLE 1.—*Arthritic Involvement of Temporomandibular Joint: Clinical Summary\**

Type of Arthritis	Percentage of Patients with Rheumatoid Arthritis	Degree of Generalized Joint Involvement	Percentage of Patients with Temporomandibular Involvement	Duration	Limitation of Opening of Jaw	Prognosis with Proper Treatment
Transitory	8	Mild or moderate	15.8	1 to 6 days	25 mm. or less	Excellent
Acute.....	20	Moderate to severe	39.2	6 to 10 weeks	Usually 10 mm. or less	Good
Chronic....	23	Severe	45.0	Over 4 months	25 mm. or less	Fair (good with surgical treatment of "burned out" group)
(Total 51%)						

\* On the basis of 100 consecutive admissions for rheumatoid arthritis.

be most apt to be seen by the practicing dentist. Opening is limited to about 10 mm. for one to three days. Neuralgic discomfort may be referred to the ear, muscles of the neck, teeth, zygoma, maxilla, mandible, temporal region or occiput or may be limited to the joint itself. These early diffuse symptoms, if unaccompanied by limitation of motion, may be confused with other syndromes of pain in the head and neck.<sup>15</sup> Complete rest of the closed jaw for two to five days with the application of heat at the site of the joint gives relief, and the prognosis is good.

Acute involvement of the temporomandibular joint in rheumatoid arthritis is the most important because on the proper handling of patients with this type of involvement rests the eventual function of the jaw. The acute type of disease occurs in 20 per cent of persons with rheumatoid arthritis. The early symptoms are similar to those previously described in the transitory type but are usually more severe, and eventually the pain becomes localized in the area of the joint anterior to the tragus; then limitation of motion makes the diagnosis obvious. Local pain, warmth and swelling are produced. There can be excruciating pain, and in some cases trigger points comparable to those of tic douloureux are present, usually in the area of the mental foramen. This period lasts from six to ten weeks, and during this time there is limitation of motion usually to less than 10 mm. of opening. Because the patient fears complete ankylosis of the jaw he performs voluntary stretching exercises, which serve only to aggravate the condition by producing severe muscular spasm and pain. The patient should be impressed with the fact that intelligent, conservative treatment in cooperative patients has always led to functional success. Physiologic rest is of paramount importance. The teeth should be in centric occlusion, barely separated, and held that way even while talking or eating. In some, a well rounded liquid diet seems desirable. Local heat over the joint is helpful. The patient must be told the importance of not stretching his jaw to see how he is

progressing. In a surprisingly short period of time, usually a few days, there is decided lessening of the muscular spasm and pain, and mild exercises are indicated. These consist of gum-chewing exercises for an hour or two a day, increasing slowly but always keeping within the limits of fatigue or actual pain. A soft gum is used first, then a harder gum. Finally two or three sticks may be used rather than one. After the larger amount of hard gum can be used for two or three hours without fatigue, a rubber horseshoe cut to fit the shape of the occlusal line is used. This is made of soft sponge rubber  $\frac{1}{4}$  inch (0.64 cm.) in thickness. Increasingly firm rubber is used, and the device is kept in the mouth several hours a day. The period of slowly increasing function of the jaw after the acute stage lasts from one to two months, rarely more. A caliper or other measuring device is used to record progress, and the measurements are made between opposing incisors. Until this writing we have always had good functional results, even after successive acute phases, when the regimen described has been carried out. However, it is only fair to say that while a good functional result (opening power of more than 25 mm.) has always been obtained, most of the patients lost a small amount of motion at the upper limit of opening. The following report illustrates treatment of acute involvement of the temporomandibular joint in rheumatoid arthritis.

#### REPORT OF CASE

Miss G. G., a Jewish woman aged 31, entered the Robert Breck Brigham Hospital on Jan. 23, 1940 with progressive rheumatoid arthritis which had started thirteen months before admission. Elbows, fingers, wrists, knees and ankles were involved at the time of entrance. Despite efforts directed toward improving her general health she had a low grade fever, and the joints remained about the same. Laboratory readings were consistent with the diagnosis of rheumatoid arthritis. During March and the first few days in April she had severe nausea and vomiting and was first seen by us on April 9 after complaining for two days of painful, stiff jaws which had followed a severe attack of vomiting. On this day there was limitation of opening to 18 mm. and a small amount of pain. Rest, massage with chloroform liniment and dry heat (hot water bottle) were started and continued until May 28. The intervening and subsequent measurements of opening power are given in table 2.

TABLE 2.—*Measurements of Opening Power*

Date	Measurement, Mm.
April 23.....	22
April 26.....	23
April 30.....	23
May 5.....	20
May 7.....	25
May 17.....	27
May 28.....	30
June 4.....	32
June 11.....	34
June 14.....	34
June 21.....	approximately normal

On May 28, because of a decrease in pain, chewing exercises were slowly started and stretching was instituted. On the last examination on June 21 the range of motion was approximately normal and without pain.

The foregoing history is typical of the course of an acute involvement and was apparently started by the trauma inflicted on the joint by an attack of severe vomiting. Trauma is a frequent forerunner of rheumatoid arthritis of the temporomandibular joint, and the condition may be brought about by any strain such as vomiting, natural malocclusion or ill fitting dentures.

When opening of the jaws is limited to less than 25 mm. for more than four months involvement of the patient's temporomandibular joint should be classed as chronic. Chronic partial or considerable limitation of motion of the temporomandibular joint is found in 23 per cent of patients entering hospitals for medical or orthopedic care. These patients may have limitation of motion due either to an "active" arthritic process in the joint or to old dysfunction on the basis of adhesions or damaged joint surfaces. In those patients with a chronic "active" process the treatment with heat, as outlined in consideration of patients with acute involvement, should be carried out and exercises begun cautiously. The larger group of patients with chronic involvement responds moderately well to treatment, and a functional result is usually obtained. We have seen 1 patient in this group who was incompletely treated progress to almost complete limitation of motion. Patients with chronic limitation of motion of a mechanical type are fewer in number, and in these strenuous stretching exercises and forcible wedging have been of value. However, the results are not so satisfactory, and it is necessary to continue the exercises ad infinitum. The presence of firm fibrous adhesions militates against the success of conservative treatment, and it is in patients with this last type of involvement that operative intervention is indicated and is successful. Kazanjian<sup>7</sup> has described a successful procedure of resecting the neck of the mandibular condyle near its head and inserting a transplant of fascia lata in the area of the resected bone. Function of the temporomandibular joint was improved by this procedure in his cases.

Treatment for subluxation of the mandible is necessary rarely in the acute stage and often in both types of the chronic stage. The patient is sometimes the first to note that his incisors do not meet. Subluxation should be treated by a stay plate similar to that used by orthodontists to lock the upper and lower incisors, but if limitation of motion is already present an open plaster collar (figs. 2 and 3) which rests behind the shoulders of the supine patient and presses against the angle of the mandible is useful. The patient rests in this when in the supine position.

While the ease with which success is obtained by the aforementioned plans of treatment is partially dependent on the unpredictable course of the disease, we feel that careful, intensive, conservative treatment at the transitory, acute and chronic "active" stages of the disease will prevent the serious complication of marked limitation of motion and make late plastic operations unnecessary. This statement is true because of the unusual anatomic relations of the joint (sliding hinge motion and a complete interarticular disk). Thus the temporomandibular joint is differentiated from all others that may be involved in rheumatoid arthritis.

#### SUMMARY

1. The temporomandibular joint was involved in 51 per cent of 100 consecutive patients with rheumatoid arthritis.
2. Complete limitation of motion (ankylosis) rarely, if ever, occurs in the temporomandibular joint.
3. The unusual anatomic relations of the joint permit a favorable prognosis, and a good functional result may be expected when the outlined treatment is carefully completed.

125 Parker Hill Avenue.

## Clinical Notes, Suggestions and New Instruments

### SPECTACLE FRAME HOLDER FOR LEVIN TUBE

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The frequent and increasing use of indwelling gastric and intestinal tubes for gavage, lavage, aspiration and drainage has suggested an improvement in the customary method of holding the catheter near the mouth or nose. The use of adhesive plaster is both unsightly and uncomfortable and often causes skin irritation.

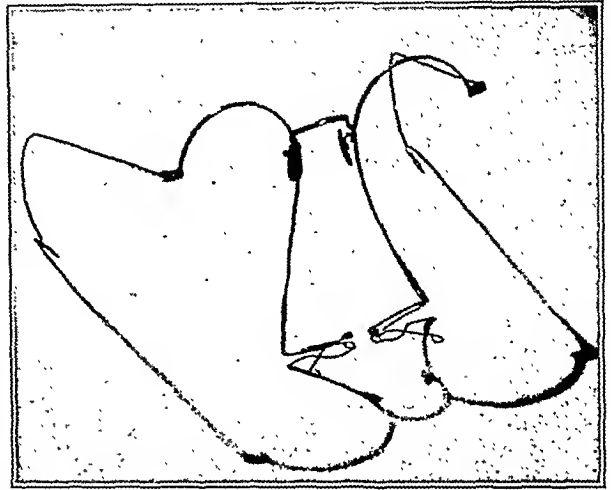


Fig. 1.—Spectacle frame holder for Levin tube.



Fig. 2.—The holder in use.

The rapid extension of the field of gastrointestinal surgery brings the Levin tube, the Miller-Abbott tube and the Wangenstein suction apparatus into daily use in preparatory and post-operative therapy. For the purpose of holding the extranasal or extraoral portion of these tubes, a spectacle frame has been

These frames were made by the Gotham Optical Company, 39 Eldridge Street, New York.



designed and used for the past two years in both the medical and the surgical service. It consists of flexible bows and a bridge which supports on either side of the nose a flexible and adjustable extension terminating in a spring clip. This frame may be comfortably worn over long periods and does not interfere with the use of eye glasses. It has been used recently in the preoperative treatment of a case of esophagospasm in which a Levin tube for feeding and another for irrigation of the dilated esophagus were used simultaneously.

1150 Park Avenue.

## REPEATED AND FATAL CORONARY THROMBOSIS IN A YOUNG MAN

DEAN MACDONALD, M.D., ST. CATHARINES, ONT.

This case is presented because it brings to the fore many questions which form the foundations of a worth while discussion.

### REPORT OF CASE

L. G., a youth aged 21, while playing softball was struck on the left side of the chest by the ball at approximately 9:30 p. m. There was no immediate effect. Walking home one hour later, he felt a heavy pressure "in his breastbone." Pain was absent. He usually ate a sandwich before retiring but on this occasion went directly to bed because of slight

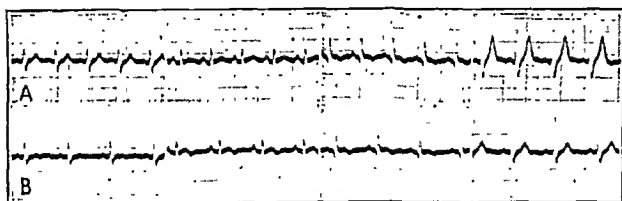


Fig. 1.—A, low voltage in leads 2 and 3. Simple tachycardia present. Reversed T wave in lead 3; B, a tracing taken six days later shows changes due to coronary infarction as evidenced by the negative T wave and the ST interval in leads 2 and 3. The voltage of the T wave has decreased considerably.

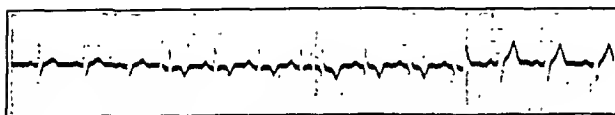


Fig. 2.—Negative T waves are still present in leads 2 and 3. The voltage of the T wave is increased in all leads.

nausea. Shortly after he went to bed—two hours after the accident—such shortness of breath developed that he was forced to sit on the side of the bed for relief. A few minutes after lying down he had to sit up again, because of dyspnea and also because of severe substernal pain (in the upper third of the chest) which radiated to the left arm and down the inner side to the middle of the forearm. At 12:30 a. m.—three hours after the accident and two hours after the first sign of abnormality—the pain had become so severe that medical advice was sought. The patient's pulse rate was 110 and the pulse was "thin," the temperature was 98.2 F. and the blood pressure 110 systolic and 60 diastolic. Auscultation revealed nothing of note in the precordial area or in the chest posteriorly. The diagnosis would have been definite for an older patient, but his age produced some uncertainty—at least for a general practitioner. (The diagnosis of coronary thrombosis in a boy 21 years old requires more than the average amount of clinical acumen.) Glyceryl trinitrate  $\frac{1}{100}$  grain (0.0006 Gm.) was given under the tongue, and within several minutes the severe precordial pain and distress had disappeared, as well as the pain in his arms. This result raised the question of angina, but in my opinion angina is more uncommon in young persons than coronary disease, and so the diagnosis became more clouded than before.

The pain returned in half an hour and, although glyceryl trinitrate and amyl nitrite gave temporary relief, the use of morphine sulfate was necessary. The next day a diagnosis of coronary thrombosis was written on the patient's chart. This

was proved by the electrocardiographic tracings taken on the fifth and eleventh days (fig. 1).<sup>1</sup> The pain in his arm was severe for twenty-four hours, and the sternal pressure lasted four days. Both disappeared gradually, and at the end of eight days all signs and symptoms had disappeared. An uneventful recovery was followed by the patient's obtaining new and easy office work which was permitted by a cardiac consultant. The length of total disability was twelve weeks. An electrocardiogram taken six weeks after the attack is shown in figure 2.

The suggested follow-up was not carried out, and the patient was not seen again until ten months later when he was awakened one morning at 4 o'clock by a substernal pain of moderate severity. (He had had his twenty-second birthday two months previously.) This pain increased in intensity and required three injections each of  $\frac{3}{4}$  grain (0.016 Gm.) of morphine sulfate and  $\frac{1}{150}$  grain (0.0004 Gm.) of scopolamine hydrobromide. When he awoke—in only two hours—the pain had decreased but was still severe enough for one more injection. By midafternoon all the pain had disappeared. He had a cough and a temperature of 100.4 F. The possibilities of other conditions were considered, only to be discarded. Twelve hours after the attack there was no sign or symptom of cardiac disease, and the patient felt so well that he wanted to go to a dance. He volunteered the information that he did not feel at all as he had after the first attack, not having residual pain, tiredness or difficulty in breathing. The blood pressure was 108 systolic and 64 diastolic, the pulse rate 72 and the pulse of a good quality. However, regardless of these negative physical conditions, his mother was told that he had suffered another attack of heart disease, which carried a relatively poorer prognosis. This was confirmed by the electrocardiographic tracings taken seven days and fourteen days later (fig. 3). He refused to stay in bed longer than two weeks and, without a word to any one, went to his office on Friday afternoon and arranged to return to work the following Monday. On the way home he came into my office, and I have often wondered whether my talk to him initiated the attack which ended so tragically less than thirty-six hours later. I said that unless he did as he was told he would have to take the consequences, which might well be fatal. He had been a restless and difficult patient, and the talk had the desired effect, because his brother reported that he went to bed without saying a word. At 5 a. m. Sunday he was awakened because of unbearable pain in the pit of his stomach (high midepigastrie). This disappeared in a few minutes "of itself," and twice in my presence an attack of excruciating pain was followed by relative freedom. These symptoms resembled those of biliary colic to such an extent that I told his family that there was a distinct possibility of gallstones (having in mind the none too rare cholelithiasis which gives a coronary T wave). This attack was accompanied by a normal pulse rate, a blood pres-

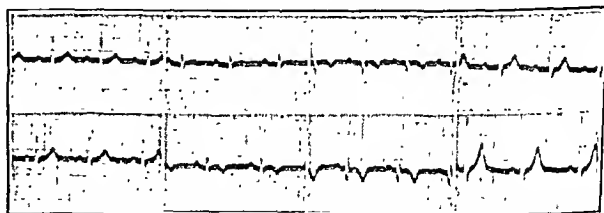


Fig. 3.—A, the T wave in lead 2 is diphasic. The tracing taken seven days later (B) shows changes characteristic of coronary thrombosis. The T wave in lead 2 has become strongly negative and the coronary ST curve has appeared. The T wave in lead 3 also has changed considerably, having a higher voltage.

sure that was the same as when last taken (110 systolic and 60 diastolic), an almost total freedom from pain between attacks, no difficulty in breathing, a temperature of 97.6 F., moderate sweating and a facial appearance of extreme pain. Indeed, colicky and penetrating pain in the upper midepigastrium was the only complaint. The absence of pain between attacks was most striking. The pain, on returning, started

1. The electrocardiograms were interpreted by Dr. C. L. Anderson.

slowly and reached an apex in about two minutes, remained unbearable for several minutes and disappeared quickly.

One-half grain (0.03 Gm.) of morphine sulfate was given and in fifteen minutes  $\frac{1}{4}$  grain (0.016 Gm.) more;  $\frac{1}{100}$  grain (0.0006 Gm.) of scopolamine hydrobromide was added. This was repeated in twenty minutes. The total dose was 1 grain

There were a few fatty plaques in the ascending aorta, but the mouths of the coronary arteries were normal.

**Microscopic Examination.**—Right Coronary Artery (fig. 4 B): Sections of this vessel at and adjacent to the site of occlusion showed an extreme degree of atherosclerosis. At the site of occlusion there was a large degenerating atheromatous plaque which had greatly reduced the size of the lumen of the vessel. Deposited on this plaque was fresh thrombus material which together with the atheroma had resulted in complete occlusion of the vessel. Immediately distal to the thrombus the lumen was reduced to a mere slit by an extremely large, degenerating atheromatous plaque.

Left Coronary Artery (fig. 4 A): Sections of this vessel showed only a small lumen because of the encroachment on it by a completely organized thrombus with recanalization in its depths. The tunica media, the tunica adventitia and the periadventitial tissues of the coronary vessels were normal.

Heart (figs. 5 and 6): Sections from the anterior wall of the left ventricle and from the anterior portion of the interventricular septum showed large areas of replacement of muscle fibers by fibrous tissue, the picture being that of healed infarction. Sections from the posterior wall of the left ventricle confirmed the presence of a recent infarct. This was evidenced by swelling and loss of cross striations of the muscle fibers in this area. In all sections the intramyocardial blood vessels were normal.

Aorta: Sections from the ascending aorta showed no abnormality apart from a few fatty plaques.

The anatomic diagnosis was (1) atherosclerosis of the coronary arteries; (2) stenosis of the coronary arteries; (3) thrombosis of the coronary arteries (old thrombosis of the left with recanalization and recent thrombosis of the right artery), and (4) infarcts of the heart (healed and recent).

#### COMMENT

In this case the severe pain resulting from a large myocardial infarct (fig. 5) during the first attack was relieved by a vasodilator as is the pain of angina. What is the relationship? To what degree did the extra supply of blood to the myocardium—which theoretically resulted from the vasodilators—relieve the pain of the pathologically proved ischemia, or was the

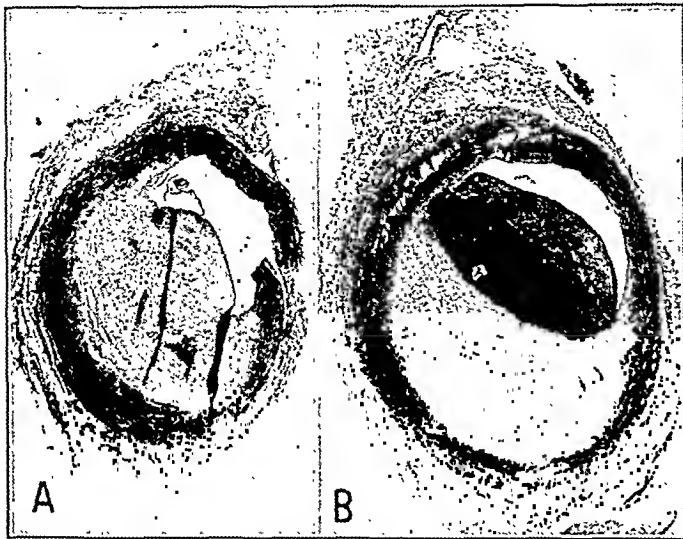


Fig. 4.—A, left coronary artery (stained with hematoxylin and eosin), showing organized thrombus with recanalization. Note the small functional lumen ( $\times 15$ ). B, right coronary artery. There is a large atheromatous plaque with fresh thrombus material completely occluding the lumen. (The small slit at the top is an artefact.)

(0.065 Gm.) of morphine and  $\frac{1}{100}$  grain (0.0013 Gm.) of scopolamine hydrobromide, which produced sleep for only three hours. On his awakening the pain was slight. During this time the pulse rate remained the same and there was no evidence of respiratory distress. Abdominal examination gave negative results. The patient fell asleep shortly and died without warning in his sleep one hour later.

#### PATHOLOGIC REPORT

The specimen consisted of a formaldehyde-fixed unopened heart from which the pericardial sac had been removed. The heart weighed 330 Gm. and appeared slightly enlarged on external examination. The chambers and appendages were of the usual size and free from thrombi. The foramen ovale was closed. The measurements of the orifices of the cardiac valves were tricuspid 14 cm., pulmonary 7.5 cm., mitral 10 cm. and aortic 7 cm. The left coronary artery immediately proximal to its point of bifurcation showed an advanced degree of stenosis, but it was not possible to say on gross examination whether this was due to a large atheromatous plaque or to an organized and recanalized thrombus. The anterior descending and circumflex branches of this vessel contained no large atheromatous plaques, but the walls appeared slightly thickened, and they were smaller than usual. The right coronary artery at a point beginning 2.5 cm. from its origin showed complete occlusion by a large atheromatous plaque on which had been deposited fresh thrombus material. From that site the occlusion extended for a distance of 2 cm. distally. The rest of this vessel and its branches were normal except for a few small atheromatous plaques. There was a healed infarct involving the lateral wall of the left ventricle and extending into the anterior portion of the interventricular septum toward the apex. This measured about 3 cm. in diameter. In the anterior portion of the septum extending up toward the base there were a few patches of confluent fibrosis. There was a diffuse change in color involving the posterior wall of the left ventricle and the adjacent portion of the interventricular septum. This was suggestive of recent infarction, although the myocardium underlying this area exhibited no palpable softening. The myocardium of the left ventricle measured 19 mm. and that of the right ventricle 5 mm. in thickness.

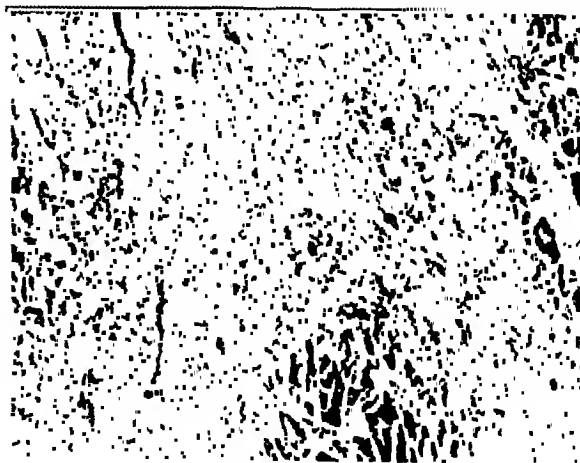


Fig. 5.—Old infarct (stained with hematoxylin and eosin). There is almost complete replacement fibrosis. A small amount of muscle is seen at the bottom and at either side of the section. Reduced from a photomicrograph with a magnification of 50 diameters.

relief a coincidence, and would it have occurred—as it did in the fatal attack—without drugs? Did the worry resulting from the talk in the office contribute to the fatal attack? Could the final attack have been caused by gallstones which produced pain severe enough to cause reflex ventricular fibrillation in a damaged heart? Does this ever occur clinically? What is the explanation of so colicky a pain?

Did this patient have symptoms in the second attack because the lumens of the coronary vessels were too small to satisfy the demands of so much muscle? Could the first attack have been precipitated by, aggravated by or in any way related to the injury to the chest? How many cases of coronary disease in younger people are diagnosed as indigestion—as this attack would have been if the pain had been less severe? As a student I was taught that coronary thrombosis carries a hopeless prognosis—a fatal outcome in relatively few years. This is now known to be wrong. Could it not be that present conceptions of coronary disorders in young people will also change during the next few years and that the mistaken diagnosis of indigestion will become much less common? Might not a young person have pathologic conditions of the heart without showing symptoms because of the greater reserve in young hearts?

#### SUMMARY

Proved coronary thrombosis occurred in a youth aged 21 years. The case was instructive because the condition was repeated twice and proved fatal when the patient was 22 years of age. The pain was relieved by vasodilators and the pain of the third attack was indistinguishable from that of cholelithiasis; such a condition should always be considered, even in young persons. The law of averages may prove that coronary thrombosis is not common under the ages of 30 to 35

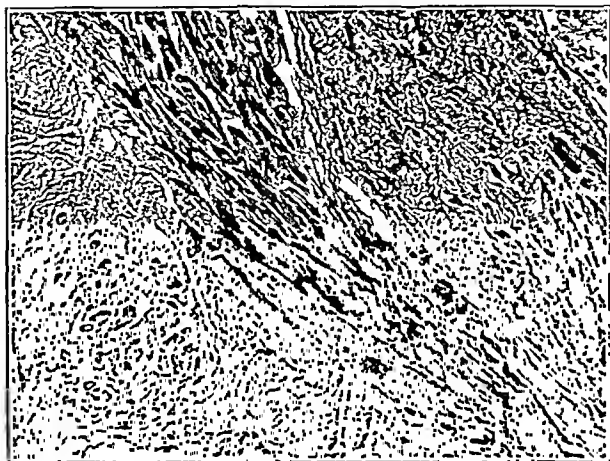


Fig. 6.—Old infarct (stained with Mallory's connective tissue stain). A few bands of heart muscle are present in the midportion. The rest is scar tissue. Reduced from a photomicrograph with a magnification of 50 diameters.

years, but this does not prove that it cannot occur. I have had intimate knowledge of this condition because at the age of 29 I was a victim, as determined by the present reliable clinical and laboratory criteria, and I know of 3 other cases, 1 of which was fatal, occurring in the twenties.

110 James Street.

#### PENETRATION OF TISSUE BY DIESEL OIL UNDER PRESSURE

JOHN E. HUGHES, M.D., SHAWNEE, OKLA.

The rapidly increasing use of high pressure appliances in industry, in which oil or grease under 4,000 to 7,000 pounds pressure is forced through small caliber openings generating an energy when misdirected, will undoubtedly result in severe tissue damage, often resulting in necessity for amputation of fingers or other parts affected.

Two cases have been reported in *THE JOURNAL*,<sup>1</sup> both resulting in amputation: one a result of Diesel oil, the other from a grease gun commonly used in garages to force grease and oil laden graphitic into spring shackles and other friction parts. This modern appliance is a far cry from the hand grease gun and screw grease cup in common use a few years ago.

1. Rees, C. E.: Penetration of Tissue by Fuel Oil Under High Pressure from Diesel Engine, *J. A. M. A.* 109:866 (Sept. 11) 1937. Smith, F. H.: Penetration of Tissue by Grease Under Pressure of 7,000 Pounds, *ibid.* 112:907 (March 11) 1939.

The Diesel engine, generally used in small maritime vessels, is rapidly becoming the power engine in many diversified industries. In the oil fields the Diesel oil used is of low viscosity and highly volatile, approaching the consistency of kero-

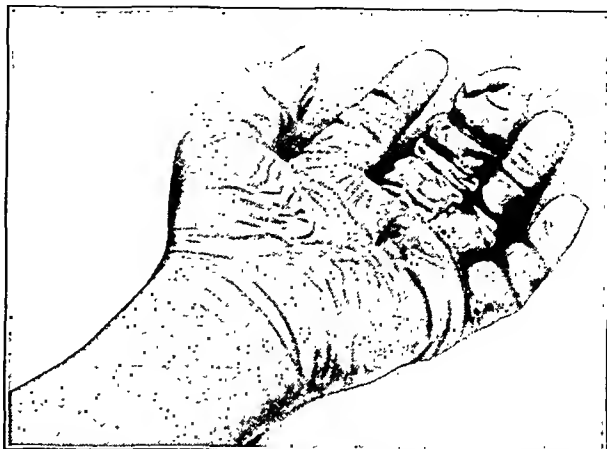


Fig. 1.—Hand three days after injury and just prior to amputation. Moist gangrene of middle and ring fingers with separation of epidermis. Maceration of remainder of hand due to wet dressings.

sene. A jet of this oil as ejected from the nozzle under 5,000 pounds pressure, with a muzzle velocity of a rifle, is capable of severe damage to tissue when contact or near contact to the nozzle is provided.

#### REPORT OF CASE

F. M., aged 31, an oil field worker, while cleaning the nozzle of a Diesel engine, had his left palm in contact or nearly in contact with the nozzle when his helper tripped the compressor. The nozzle has five pin point openings, each opening one ten thousandth of an inch in diameter. Numbness in the hand was immediately experienced, and he observed three little drops of blood coming from the three pin point openings on the volar surface at the base of the left middle and ring fingers. Numbness was soon followed by severe pain in the hand. I saw him six hours after the injury suffering intense pain, which was only partially relieved by morphine. His hand was slightly



Fig. 2.—Discoloration of nail of middle finger and separation of epidermis.

swollen, and the three pin point openings looked trivial. He was admitted to the hospital two hours later, where additional morphine was given for relief of pain and the hand was elevated and placed in a hot wet boric pack. He continued to require morphine for relief of pain, and on the third day

it was noticed that the finger nail bed of the left middle finger was dark and that the epidermis of the palmar surface had loosened. The underlying structures were dark red. Multiple incisions were made in the hope of relieving tension in the tissues. These did not bleed. The following morning an amputation was done of the middle and ring fingers; the latter had also become gangrenous. The fingers were amputated at the metacarpophalangeal joint. There was not sufficient flap to suture and the wound was left open. Pain in the hand was immediately relieved, and the temperature of 100 to 103 F., which had existed since the morning of the injury, dropped to normal. After four weeks the wound has nearly healed, and the patient will have almost a perfect result in the rest of the hand.

## COMMENT

What is the cause of the gangrene in these cases? The wound as far as the external surface appears most trivial. The amount of Diesel oil, possibly, 2 to 3 cc. forced into the tissue, would not appear to be bulky or toxic enough to produce circulatory strangulation. Or is it the sudden volatilization of this jet of oil under tremendous pressure sufficient to produce a massive thrombosis of the blood vessels? The almost immediate onset of pain and its continuation regardless of heavy doses of morphine might suggest the latter view.

14 East Ninth Street.

## Council on Foods and Nutrition

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.  
FRANKLIN C. BING, Secretary.

### NUTRITIONALLY IMPROVED OR ENRICHED FLOUR AND BREAD

Wheat in its various forms contributes 25 per cent or more of the average daily caloric intake of persons residing in the United States. The nutritive value of wheat and its products has been discussed for more than one hundred years. Sylvester Graham, in the early part of the nineteenth century, stressed the healthful properties of whole wheat as compared with the more refined products, but scientific evidence in support of his contentions was not forthcoming until after the beginning of what may be called the "vitamin era" in nutrition. In 1916 McCollum and his co-workers<sup>1</sup> called attention to the high content of the antineuritic factor, then called "water-soluble B," in wheat germ, and in 1919 Osborne and Mendel<sup>2</sup> reported their classic study of the nutritive value of the wheat kernel and its milling products, a project undertaken during the first World War. The latter investigators estimated that the wheat kernel consists of about 83.5 per cent endosperm (the white, starchy portion of the grain), 1.5 per cent embryo or germ (the growth center of the grain) and about 15.0 per cent bran (including some inner seed coats). They showed that the embryo was indeed rich in the antineuritic factor, but that some was also present in the bran and even small amounts in the endosperm. They also discussed various aspects of the question to what extent should wheat be milled? Their article left no doubt that the question needed further experimental study, but, after the war, general scientific interest in the nutritional problem presented by the milling of wheat tended to diminish. However, in 1922 Bell and Mendel<sup>3</sup> undertook some further studies on the distribution of the antineuritic vitamin, then known as vitamin B and now identified as thiamine, in the wheat kernel. Their studies gave clear indication that, while the wheat embryo is rich in this vitamin, it accounts for only about 15 per cent of the total vitamin B<sub>1</sub>

content of the grain because of the small proportion of embryo in the wheat kernel. Wheat from which the embryo has been removed by dissection still contains much of the vitamin B<sub>1</sub>. Patent (white) flour, representing from 60 to 70 per cent of the entire grain, contains only 10 per cent or less of its total vitamin B<sub>1</sub> content. Thus, the use of refined white flour rather than whole wheat flour represents the substitution of a food extremely low in vitamin B<sub>1</sub> for a food that is a good source of this dietary essential. Many additional studies corroborate this view and have shown, further, that other essential dietary components, vitamins and minerals, are also more concentrated in the parts of the grain removed in the milling of wheat for the preparation of flour.

## COMPOSITION OF WHEAT, WHOLE WHEAT FLOUR AND WHITE FLOUR

There now are available many reports of the vitamin B<sub>1</sub> (thiamine) content of the wheat grain. These reports have shown that the thiamine content is somewhat variable, depending on a number of factors such as locality, soil and weather conditions during the growing season. There seems to be a real difference between the thiamine contents of hard and soft wheats. According to the figures of Booher and Hartzler,<sup>4</sup> which are in harmony with other data reported in the literature, soft wheat contains about 118 international units of vitamin B<sub>1</sub> to each hundred grams; hard winter wheat contains about 159 and hard spring wheat about 175 international units of vitamin B<sub>1</sub> to each hundred grams.

Other components of the wheat grain which have been given consideration in recent discussions of the nutritive values of flour are calcium, phosphorus, iron, riboflavin and nicotinic acid. Whole wheat flour may be considered an excellent source of at least two of these factors, phosphorus and iron. It also provides important amounts of riboflavin and nicotinic acid.

Although the data on the quantities of riboflavin and nicotinic acid in wheat are not extensive, an attempt has been made to provide in tables 1 and 2 the composition of average whole wheat flour and white patent flour with respect to these and other dietary essentials under discussion. In table 1 the values are reported in terms of milligrams of the various constituents to the pound. For purposes of reference, these values are reported in table 2 in terms of milligrams per hundred grams. The vitamin values listed in each table also are reported in terms of the conventional biologic units. Data regarding the composition of flour enriched according to the definition and standard proposed by the U. S. Food and Drug Administration<sup>5</sup> and in principle endorsed by the Committee on Food and Nutrition of the Division of Medical Sciences of the National Research Council and by the Council on Foods and Nutrition of the American Medical Association also are included in the tables. The tables show that whole wheat flour contains about 150 and white flour only about 17 international units of vitamin B<sub>1</sub> to each hundred grams. Riboflavin is present in whole wheat to the extent of about 83 Sherman-Bourquin units and in white flour to the extent of about 13 units to each hundred grams, calculations being made on the basis that 3 micrograms (0.003 mg.) of riboflavin are equivalent to 1 Sherman-Bourquin unit. There is some recent evidence that the nicotinic acid content of wheat and its milling products may be greater than is indicated in the table.

Thiamine is the component which makes whole wheat most significant in the diet at the present time. This is emphasized by the reports of Baker, Wright and Drummond,<sup>6</sup> discussed by Cowgill<sup>7</sup> in his review of "The Need for the Addition of Vitamin B<sub>1</sub> to Staple American Foods." These reports show that the parish poor of England in 1839, according to records of foods which they were given, probably received about 650 to 850 international units of vitamin B<sub>1</sub> daily, whereas supposedly

1. McCollum, E. V.; Simmonds, Nina, and Pitz, W.: The Nature of the Dietary Deficiencies of the Wheat Embryo, *J. Biol. Chem.* **25**: 105 (May) 1916.

2. Osborne, T. B., and Mendel, L. B.: The Nutritive Value of the Wheat Kernel and Its Milling Products, *J. Biol. Chem.* **37**: 557 (April) 1919.

3. Bell, Marion, and Mendel, L. B.: The Distribution of Vitamin B in the Wheat Kernel, *Am. J. Physiol.* **62**: 145 (Sept.) 1922.

4. Booher, Lela E., and Hartzler, Eva R.: The Vitamin B<sub>1</sub> Content of Foods in Terms of Crystalline Thiamine, Technical Bull. 707, United States Department of Agriculture, Bureau of Home Economics, 1939.

5. Federal Register **6**: 1729 (April 1) 1941.

6. Baker, A. Z.; Wright, M. D., and Drummond, J. C.: The Nutritive Value of Bread, *J. Soc. Chem. Ind.* **56**: 191 (Trans.) 1937.

7. Cowgill, G. R.: The Need for the Addition of Vitamin B<sub>1</sub> to Staple American Foods, *J. A. M. A.* **13**: 2146 (Dec.) 1939.

good diets of persons in moderate circumstances in England in 1939 supplied only about 450 to 550 international units of vitamin B<sub>1</sub>. Stiebeling and her associates<sup>8</sup> have shown that the vitamin B<sub>1</sub> intake of contemporary families with liberal food allowances in the United States is not more than from 460 to 740 international units "per man per day," and that persons in the lowest income groups obtain an average of only 280 to 330 international units. This decided reduction in the

TABLE 1.—Average Composition of Whole Wheat, White Flour and Enriched Flour

Milligrams and International or Sherman-Bourquin Units per Pound.									
Product	Ca	P	Fe	Thiamine		Riboflavin		Nico- tinic Acid, Mg.	Vita- min D, U.S.P. Units
				Mg.	Inter- na- tional Units	Mg.	Sher- man- Bour- quin Units		
Whole wheat	240	1,700	18	2.04	680	1.13	375	12.3	...
White flour	72	460	4.5	0.23	77	0.18	60	3.7	...
Enriched flour									
Minimum enriched...	500*	.....	6.0	1.06	553	1.2	400	6.0	250*
Maximum enriched...	2,000*	.....	24.0	2.5	830	1.8	600	9.0	1,000*

\* Items, for the present, optional ingredients.

vitamin B<sub>1</sub> intake must be attributed to the prevailing use of refined sugar and highly milled wheat products, principally white flour, in the twentieth century as compared to the less refined flour used in the early nineteenth century. Jolliffe<sup>9</sup> has pointed out that the average American diet of today provides about the same number of calories in the form of sugar and white flour as were provided in the form of less refined flour by the average diet of the past. In each instance the calories so provided constituted approximately half of all the calories. This half, which formerly came mostly in a coarse flour representing a good source of thiamine and containing important amounts of other vitamins as well as minerals, has later been replaced about equally by refined sugar and white patent flour.

Despite the greater consumption of fresh fruits and vegetables and other so-called protective foods, it has not been possible to make up the loss of thiamine which results from the substitution of sugar and white flour for the old time stone-ground flour. This is because the other foods, important as they are for other reasons, are relatively poor sources of thiamine as compared with whole wheat. Although whole wheat is an excellent dietary source of iron and a good source of riboflavin and nicotinic acid, the known differences between whole wheat and white flour with regard to calcium, phosphorus, iron, riboflavin and nicotinic acid are less important than the differences in thiamine. This is because other foods are available which are excellent sources of one or more of the former group of dietary essentials. Thus milk is an outstanding source of calcium, phosphorus and riboflavin. Meats are important sources of nicotinic acid and riboflavin, and iron is supplied in small amounts by many foods.

#### COMPOSITION OF NUTRITIONALLY IMPROVED FLOURS AND BREAD

On the basis of the foregoing statements, it is apparent that any steps to improve the nutritional value of American diets should include restoring to wheat milling products the high nutritive value of the whole wheat grain with particular reference to thiamine. Such action would be in harmony with the principles established by the Council on previous occasions, namely (1) in the processing of foods, every effort should be directed to retaining in the products the food values of the natural foods from which they are made; (2) for those processed foods which are not nutritionally equivalent to the original foods from which they have been made, it is in the interest of the public to restore certain dietary essentials so that these

processed foods have the full nutritive value of the natural foods, with respect to the substances added.

There now are available two methods by which the thiamine and other nutritive values of wheat may be restored. These are (1) the use of special milling processes which retain the major portion of the vitamin and mineral content of the grain with a minimum of coarse fiber derived from the outer branny coats and (2) the addition of crystalline vitamin preparations and mineral salts. When concentrated vitamin preparations or mineral salts, or both, are added to processed foods such as flour it is essential first that the substances added should be those for which a greater distribution is in the interests of public health, and, further, that the processed foods should be a suitable vehicle for the added minerals and vitamins. The added substances should mix well with the food and not lose potency during the usual conditions of storage. They also must be in a form which is biologically available to the consumer and which does not adversely affect the other nutritional values of the product. The materials used for the aging and bleaching of flour, namely nitrogen peroxide, benzoyl peroxide, nitrogen trichloride and chlorine (or chlorine containing small amounts of nitrosyl chloride) in the amounts added, are reported not to have a deleterious effect on the vitamins and minerals under consideration.

Substances which can be advantageously added to white flour and which are now available in suitable form are thiamine, riboflavin, nicotinic acid and salts of iron, calcium and phosphorus. The aim in adding these dietary essentials to processed foods such as flour is to provide dietary essentials which people must get from foods in order to maintain good nutrition and health. The restored cereals simply offer another source of these dietary essentials. They may make it easier for the person unskilled or unversed in nutrition to obtain the vitamins and minerals which he should have in his food. The principle of restoration to high natural levels, which has been sponsored by the Council, means essentially fortification with a limit, that limit being the content of the natural or unprocessed foods. That this principle has merit is conceded by many authorities in nutrition, who agree that by proper selection of natural foods one can readily obtain an adequate amount of all the dietary essentials. The restoration program also fits admirably into the educational program of nutritionists and others concerned with teaching the public to recognize certain classes of foods as contributors of certain necessary components of the diet.

According to this plan white flour would have to have added to it calcium, phosphorus, iron, thiamine, riboflavin and nico-

TABLE 2.—Average Composition of Whole Wheat, White Flour and Enriched Flour

Milligrams and International or Sherman-Bourquin Units per Hundred Grams									
Product	Ca	P	Fe	Mg.	Thiamine	Riboflavin		Nico- tinic Acid, Mg.	Vita- min D, U.S.P. Units
					Inter- national Units	Mg.	Sher- man- Bour- quin Units		
Whole wheat	53	374	3.9	0.45	150	0.25	83	2.71	...
White flour	16	101	1.0	0.05	17	0.04	13	0.61	...
Enriched flour									
Minimum enriched...	110*	...	1.3	0.37	123	0.26	87	1.3	55*
Maximum enriched...	441*	...	5.3	0.55	185	0.40	133	2.0	220*

\* Items, for the present, optional ingredients.

tinic acid in order to bring it up to the levels of whole wheat as shown in table 1. Of these dietary essentials the most important, so far as American food habits are concerned, are thiamine and iron. The other essentials supplied by whole grain cereals furnish "plus values," although under certain circumstances, when meat and milk are not readily available, some of them, notably riboflavin, nicotinic acid and calcium, may assume greater importance.

From the beginning of its considerations the Council has recognized that even whole wheat is but a minor source of calcium in the diet. It was therefore decided that, if calcium

8. Stiebeling, Hazel K., and Phipard, Esther F.: Diets of Families of Employed Wage Earners and Clerical Workers in Cities. Circular 507, United States Department of Agriculture, Bureau of Home Economics, 1939.

9. Jolliffe, Norman: A Clinical Evaluation of the Adequacy of Vitamin B<sub>1</sub> in the American Diet. Internat. Clin. 4:46 (Dec.) 1938.



is to be added to white flour, it would be well not to stop at the level of the whole grain but to add an amount which is really significant from the nutritional point of view. If adult requirements for calcium are in the neighborhood of 0.7 Gm. daily and if the caloric requirements of a moderately active man are approximately 3,000 calories, then each hundred calories of food will do its share in meeting the calcium requirements if it provides 23 mg. of calcium. One hundred Gm. of whole wheat flour provides 350 calories, but only 53 mg. of calcium. If fortification is made to some simple multiple of the total calcium requirement, the figure 3 being considered reasonable, then improved white flour might have a calcium content equal to 75 mg. per hundred calories, equivalent to about 265 mg. per hundred grams, or about 1.2 Gm. per pound.

With the calcium brought up to this level, there is no reason why phosphorus should not be permitted to be present in equal amounts, or at least in amounts which would provide, in the fortified product, a calcium-phosphorus ratio which is considered desirable. This latter consideration is of little practical importance, however, because it is the ratio of calcium and phosphorus in the diet as a whole which is of importance to the organism, not the ratio which may occur in any single constituent.

It is of interest to note that other points of view regarding the basis for the restorative addition of vitamins to white flour lead essentially to the same results as those proposed by the Council. With regard to thiamine, it is known that this factor is concerned with the oxidation of carbohydrates. It has been estimated that approximately 25 international units of thiamine are necessary for the oxidation of 100 calories from carbohydrate. On this basis 100 Gm. of white flour, which yields approximately 350 calories, would require 87.5 international units of thiamine for its metabolism, or slightly more than half of the amount of thiamine present in an equal weight of whole wheat flour. However, in view of the well known dietary deficiencies of granulated cane or beet sugar, which now contributes to the American diet almost as many calories as does flour, the suggestion is made that thiamine should be added to flour in quantities sufficient to provide not only for itself but for the calories of sugar as well. On this basis, if flour is to provide the thiamine necessary to metabolize its own carbohydrate content as well as the carbohydrate derived from sugar, it must be enriched to the level of approximately 175 international units per hundred grams, equivalent to 2.38 mg. per pound. This figure is only slightly higher than the average thiamine content of mixed whole wheat and less than has been reported for many individual samples.

Similar conclusions may be reached if the problem is considered from the point of view of the amount of thiamine and other dietary essentials which should be furnished by the quantity of flour usually eaten in one day. It has been estimated that the average daily intake of wheat flour is in the neighborhood of 6½ ounces, equivalent to about 650 calories. If it is assumed that a desirable intake of thiamine for a person who needs 3,000 calories is in the neighborhood of 500 units, then each calory should be accompanied by approximately 0.166 international unit, and 6½ ounces of flour should have 108 international units. The average daily consumption of sugar is said to be about 565 calories, which, according to these views, should be accompanied by about 94 international units of thiamine. On this basis, if flour is to provide for its own thiamine needs plus those of sugar, 6½ ounces of flour should provide not less than 202 international units of thiamine, equivalent to 500 international units, or 1.66 mg. per pound.

At hearings called in Washington in the fall of 1940 to consider proposals for the new definitions and standards for white flour and related products, the following view was presented: If a product such as white flour is to be nutritionally improved, then the dietary essentials added to it should be only those which are stable under usual conditions of storage and handling of flour, and only those substances which are essential in the diet should be added. The amounts added ought to be commensurate with the dietary requirements. If flour makes up about one fourth of the daily caloric intake, then that flour may well provide a minimum of one fourth of the daily require-

ment of the dietary essentials to be added. A convenient maximum figure would be four times this lower level. Appropriate additions to white flour, according to these views, would be vitamins A, B<sub>1</sub>, D, riboflavin and nicotinic acid and the minerals calcium, phosphorus and iron. Evidence now available does not justify additions of pantothenic acid, vitamin E, vitamin B<sub>6</sub> or substances other than those enumerated. A nutritionally improved flour prepared in accordance with this standard would have, in each pound, the following minimum and maximum composition with respect to the minerals and vitamins named: minimum, 496 mg. of calcium, 496 mg. of phosphorus, 6.15 mg. of iron, 0.48 mg. of thiamine, 1.23 mg. of riboflavin, 6.15 mg. of nicotinic acid and 250 U. S. P. units of vitamin D; maximum, 1,980 mg. of calcium, 1,980 mg. of phosphorus, 24.8 mg. of iron, 1.92 mg. of thiamine, 4.92 mg. of riboflavin, 24.8 mg. of nicotinic acid and 1,000 U. S. P. units of vitamin D. There would appear to be no good reason for adding more than the maximum quantities proposed.

It is interesting that with the exception of vitamin D the standards set up by the Council comply with either the minimum or maximum values suggested at these hearings. In the case of vitamin D it has been the considered opinion of the Council that fortification of cereal products with vitamin D is not desirable in the light of evidence heretofore available. There is but little evidence that adults, with the exception of pregnant women, need this vitamin in amounts greater than are ordinarily obtained from foods and the vitamin D effects that are derived from exposure to direct sunlight. However, newer evidence has been obtained that vitamin D may be of importance because of its favorable effect on the utilization of the phosphorus of cereals. Further, if calcium salts in significant amounts are added to cereal products it may be well to add vitamin D also. These points are sufficient to indicate the complexity of the problem, which is being studied further by the Council and which will be the subject of a future report.

The question of the nutritional improvement of white flour also was given early consideration by the Committee on Food and Nutrition of the National Research Council. Like other groups who have considered the problem, this committee approved discriminate fortification of flour. The standards for enriched flour which it endorsed and which essentially have been adopted by the Food and Drug Administration (table 1) are not dissimilar from those adopted by the Council on Foods and Nutrition of the American Medical Association and were approved by the Council at a meeting in Chicago, Nov. 18, 1940.

#### COUNCIL STANDARDS FOR NUTRITIONALLY IMPROVED FLOUR AND PRACTICAL METHODS OF ATTAINING THEM

The Council is ready to accept nutritionally improved flour preparations which have been formulated according to policies developed in this report and which have a nutritive value equal at least to that represented by the minimum standards for enriched flour proposed by the U. S. Food and Drug Administration, provided the product also complies with the rules of the Council.

A number of suitable preparations now are available for use in improving the nutritive value of flour. Calcium and phosphorus in the form of their various salts may be added to foods. Such additions present no problem, except that it may be important to call attention to the necessity of using products that are relatively free from fluorine and lead. Unpublished evidence provided by members of the milling industry indicates that the addition of salts of iron in amounts required to meet the standards adopted for enriched flour does not present any unsurmountable difficulties with regard to the keeping quality or the stability of the vitamins in the mixture or in the taste of the product if a suitable form of iron is used. Iron phytate, sodium ferric pyrophosphate and ferrum reductum have been employed, but the Council is reserving judgment on the best iron salt to be added until further information is collected about the availability of the iron in these preparations. Obviously there is no nutritional advantage in adding an iron compound if the iron is not available to the body or if the iron has a damaging effect on other constituents of the flour.

Nicotinic acid can be added as such or in the form of its amide, the latter probably being the preferable form. While

no difficulties have arisen with small physiologic amounts of nicotinic acid such as may be present in whole wheat, yet the uncomfortable flushing caused in some persons by therapeutic doses of nicotinic acid indicates the desirability of using the amide, which does not produce untoward reactions. Riboflavin may be added in the form of the pure preparation isolated from natural sources or as a synthetic product. Thiamine may be added in the form of thiamine hydrochloride, which is commercially available as a synthetic product that meets U. S. P. specifications.

Another means of increasing the thiamine, riboflavin and nicotinic acid content of flour is by the addition of natural substances rich in these essentials. Thus dried yeast may be used as a source of all three vitamins. A dried extract of a riboflavin concentrate derived from biologically activated grain, by bacteriologic methods, is available as a source of riboflavin. Wheat germ is a source of thiamine, although the use of this product has natural limitations because several times the amount of germ present in the grain must be added to white flour in order to give the full vitamin B<sub>1</sub> value to the flour so fortified, and the baking qualities of the flour are said to be affected by the use of too large proportions of wheat germ.

Whole wheat itself is one of the best natural sources of these vitamins, and one important method of obtaining a flour of higher vitamin content is to include a larger portion of the grain by special milling processes. At least two methods are in commercial operation in the United States. One such method yields a white flour which contains the major portion of the germ so finely ground that it is indistinguishable to the naked eye from ordinary white flour. Another likewise involves the incorporation of more of the germ and aleurone layers of the grain in the finished product.

Information concerning the composition of a number of nutritionally improved flour preparations manufactured by special milling processes has been made available to the Council and is shown in table 3. Germako and Vito Wheat Product are flour preparations which represent from about 85 to 95 per cent of the wheat kernel. Melior and Vibic flours also contain a large proportion of the whole grain. In addition there has been added to Vibic flour sufficient calcium, iron and riboflavin to restore its content of these dietary essentials to the high levels natural to whole wheat. All these flours produce breads of similar texture but of darker color than those made with

Drug Administration<sup>9</sup> are rapidly being made available both for use by commercial bakeries and for sale by retail grocers. The majority of these flours are patent flours to which has been added sufficient crystalline thiamine hydrochloride, riboflavin, nicotinic acid and iron to comply with the minimum legal standard for enriched flour.

*The Need for Standards for Bread.*—It is expected that within a year hearings will be held for the purpose of developing a definition and standard for bread in accordance with the provision of the Food, Drug and Cosmetic Act. This is urgently needed not only for the protection of the consumer but for the

TABLE 4.—Suggested Standards for Enriched Bread

	Milligrams per Pound			Thia-	Ribo-	Nicotinic
	Ca	P	Fe	mine	flavin	Acid
Minimum enriched.....	300*	—	4.0	1.0	0.8	4.0
Maximum enriched.....	1,200*	—	16.0	2.0	1.6	8.0

\* Optional.

guidance of the baking industry. Bread enriched with important dietary essentials found in whole wheat can now be marketed if properly and informatively labeled.

Approximately 50 per cent of the flour consumed in the United States is made into bread by commercial bakeries. It has been shown that the baking of bread results in a loss of not more than from 10 to 15 per cent of the thiamine originally present in the flour, such loss as does occur being in the crust. This is largely because the temperature within the interior of the loaf does not exceed that of boiling water. The loss of thiamine in other baked goods or other products made from flour has not been studied in detail, but it may be considerable. The Committee on Food and Nutrition of the Division of Medical Sciences of the National Research Council has endorsed standards for enriched bread which shall contain at least two thirds of the quantities of the nutritional essentials of enriched flour to the pound, less 15 per cent of the thiamine due to loss in baking. Details of the proposed standards are shown in table 4. There should be no difficulty in attaining these standards if the flour used in the baking of bread has the nutritive value of the nutritionally enriched flour.

The fact that yeast is added to the dough as a leavening ingredient affords another possibility for improving the thiamine content of bread. Ordinary white bread contains about 50 international units of vitamin B<sub>1</sub> to a pound loaf—occasionally 100 units to the loaf. Whole wheat bread contains about 450 or more international units to the pound loaf. It is possible to produce a white bread containing approximately 450 international units to the pound loaf by using no more than the customary amounts of yeast (2 per cent, based on the weight of the flour used) if the yeast is a product sufficiently high in thiamine. Suitable products now are available commercially not only for the purpose of increasing the vitamin B<sub>1</sub> content of bread but for supplying nicotinic acid, iron and some riboflavin and other factors as well. Free<sup>10</sup> has reported that with the use of moderate amounts (an average of four or five slices daily) of bread made with yeast high in thiamine the total thiamine intake of normal young women of college age was raised to from 0.74 mg. to 1.4 mg. daily. It was estimated that the special bread contributed about 34 per cent of the total thiamine intake.

SIGNIFICANCE OF NUTRITIONALLY IMPROVED FLOURS IN THE DIETS OF ADULTS

It is apparent from the foregoing discussion and from the figures provided in the tables that nutritionally improved flours and breads made in accordance with the standards discussed will make possible a marked improvement in the diet. Flours made in accordance with the principles adopted by the Council may have the full nutritional value of whole wheat flour with respect to thiamine and such other important dietary essentials

TABLE 3.—Composition of Some Nutritionally Improved Flour Preparations Prepared by Special Milling Processes

Milligrams per Pound					
Product	Manufacturer	Ca	Fe	Thia- mine	Ribo- flavin
Vibic.....	General Mills, Inc., Minneapolis	204	22.7	2.40	1.18
Vito Wheat Product	Pillsbury Flour Mills Co., Minneapolis	...	...	2.59	0.68
Germako.....	Fisher Flouring Mills Co., Seattle	...	...	1.95	...
Melior Flour.....	Victor Flour Mills, Pittsford, N. Y.	...	...	1.10	0.344
Flour containing the major portion of the wheat germ	Morris Mills, Inc., Chicago and Morris, Ill.	...	3.6	0.59	...

These products may meet the nutritional requirements for enriched flour by the addition of smaller quantities of vitamins and minerals than it is necessary to add to white flour.

white patent flour. The flavor also is somewhat different but is considered highly agreeable by many persons.

Flour prepared by the process developed by Morris Mills, Inc., retains the major portion of the wheat germ but little or none of the outer coats. It is white and has baking qualities very similar to those of the customary patent flour. Its thiamine content is greater than that of white patent flour but less than that of whole wheat or of products restored to the level of whole wheat.

Brands of white flour enriched with crystalline vitamin preparations and mineral salts which conform to the definition and standard for "enriched flour" promulgated by the Food and

10. Free, A. H.: Increase of Vitamin B<sub>1</sub> Intake By the Use of Special High Vitamin B<sub>1</sub> Bread, *Cereal Chemistry* 17: 725 (Nov.) 1940.

as have been added. These improved flours make it possible to have much of the nutritional advantages of whole wheat. They do not fully take the place of whole wheat unless prepared by special milling processes, nor do they minimize in any respect the necessity of extending educational efforts directed to the guidance of the public in the selection of adequate diets.

**Adult Diets.**—It has been shown by the dietary surveys referred to earlier in this report<sup>8</sup> that the adequacy of the diet in vitamin B<sub>1</sub> in different sections of the United States may depend to a large extent on the amount of money which can be spent for food. Families living in Southern cities whose weekly food expenditures ranged from \$0.63 to \$1.24 for each person obtained diets containing from about 280 to 330 international units of vitamin B<sub>1</sub>, based on an estimate of the vitamin content of the raw foods. At higher levels of expenditure for food the estimated average vitamin B<sub>1</sub> content of the diets of different regional groups increased gradually but it was not until weekly food expenditures reached as much as \$2.50 to \$3.12 per person that most families obtained diets averaging more than 500 international units per person daily. (In this instance the "person" is considered to be a man of moderate activity who requires in the neighborhood of 3,000 calories a day.) Family food supplies costing more than \$3.12 a person a week averaged from 460 to 740 international units per person daily.

It is generally agreed that about 333 international units of thiamine is the minimum intake which will prevent beriberi, and newer evidence indicates that more than this is required to prevent milder symptoms of thiamine deficiency. Also more is required by men of unusually large stature, particularly if engaged in occupations requiring an unusual degree of physical activity. Various opinions have been advanced as to the probable intake which will be satisfactory for adequate nutrition and for the prevention of subclinical states of thiamine deficiency. Until recently it has been considered that an allowance of about 500 international units daily, equivalent to about 1.66 mg. of thiamine, provided a liberal standard for the adult man of moderate activity. Recent studies by Williams and his associates<sup>11</sup> on the effect of induced thiamine deficiency in man indicate that an intake of 2 mg. of thiamine daily, equivalent to 666 international units, may be needed by an active adult man.

Diets which are considered adequate in all of the known dietary essentials can be selected from a wide variety of foods and at various levels of cost. However, it has been the experience of all persons who attempt to plan nutritionally adequate diets at low levels of cost that a relatively large proportion of cereal products, which are relatively inexpensive, must be included and that smaller amounts of the more expensive "protective" foods can be used. For this reason it is important that the cereal products used in low cost diets be of high nutritional value. In the plans developed by Carpenter and Stiebeling<sup>12</sup> for adequate diets at four different levels of cost the weekly allowances of flour and cereals for the moderately active man of average weight are 5 pounds 4 ounces for a restricted diet for emergency use, 4 pounds 8 ounces for an adequate, or "good," diet at minimum cost, 4 pounds for an adequate diet at moderate cost, and 2 pounds 4 ounces for a liberal diet. This is not more than is customarily used by many families in the respective income groups and may be considerably less than is consumed in many low-income families.

The importance of whole grain cereals, particularly in low cost diets in which cereal products are used to replace some of the more expensive "protective" foods, may be illustrated by the fact that in the proposed restricted diet for emergency use the use of all whole grain cereals, represented by whole wheat, instead of all refined cereals, represented by white flour, would result in an increase of about 456 international units, equivalent to 1.37 mg. of thiamine per man daily. In the "good" diet at low cost such substitution would result in

an increase of about 390 international units, or about 1.17 mg., of thiamine for each man daily, and even in the liberal diet the use of whole wheat instead of refined white flour would make a difference of about 194 international units, or about 0.58 mg. of thiamine per man daily. These higher amounts of thiamine, so easily obtainable, undoubtedly are of great significance not only for the health of persons in the lower income groups but also for those whose food expenditures are not restricted for financial reasons.

**Children's Diets.**—The use of whole grain cereal products may result in even more important additions of thiamine to children's diets. Investigations of the thiamine requirements of children of preschool age indicate that approximately 25 international units per kilogram of body weight, equivalent to about 1 mg. (333 international units) of thiamine daily, should be allowed. Because of the rapid growth and physical activity of children, particularly boys of adolescent age, the thiamine requirements of this age group are relatively high and may be higher than those of adults. Standards of 2 mg. of thiamine daily for adolescent girls and of 2.5 mg. for adolescent boys have been suggested. On the basis of the cereal allowances proposed by Carpenter and Stiebeling the exclusive use of whole grain cereals instead of the refined products may be expected to result in the addition of from 65 to 239 international units of vitamin B<sub>1</sub> to the diets of preschool children, from 130 to 333 international units to the diets of children of school age and from 178 to 456 international units to the diets of active adolescent boys, depending on the income level for which the diet is planned. Similarly such use of whole grain cereals may be expected to result in additions of from 1.6 to 4.1 mg. of iron to the diets of preschool children, from 3.1 to 7.3 mg. to the diets of children of school age and from 4.7 to 14.1 mg. to the diets of active adolescent boys.

Although whole grain cereals are nutritionally preferred foods, the Council recognizes that the present day popular preference for white flour cannot be altogether ignored. This preference is based in part on the relatively better keeping qualities of white flour as compared to whole wheat flour and in part on the fact that the baking qualities of the best grades of white flour have been developed to a high state of perfection by the manufacturers of these products. The new enriched white flours provide the housewife with products of physical characteristics and baking qualities similar to those with which she is now accustomed. Because these products are designed to provide dietary essentials for which a wider distribution is important, if not imperative, for certain groups of the population, the Council believes that it is in the interest of public health and welfare to encourage the wider distribution of this type of product, along with the greater use of whole wheat products. The following quotation from an article by Dr. R. R. Williams<sup>13</sup> in *Cereal Chemistry* is of interest in this connection:

Unquestionably, from a long range business standpoint the greatest opportunity for the miller, and the sugar refiner as well, is to find a way to meet popular demands without continuing to call upon their customers to disregard Nature's laws, or to make up the deficiencies of the carbohydrate staples by judicious use of other foods. One cannot of course ignore the popular fancy for white bread, nor the concrete fact that whole cereals or their mill products are more subject to spoilage than the white forms (in part for the excellent reason that the latter will scarcely support bacterial or insect life). One cannot wholly ignore the testimony of qualified physicians, that branmy roughage is irritating to the intestinal tracts of some people, though that is probably more a matter for the hospital dietitian than for the housewife. All these are parts of the large problem which the carbohydrate industries face, that of making their staple products more nearly the equivalent in nutritive value of the whole seed or the cane stalk as it was once consumed by primitive man. Whether this is to be done by additions of synthetic materials or by retention of the original nutritive components of the crude foodstuffs is a question for industry to decide. To blink at the scientific facts, which will presently become common knowledge, will be suicidal for the commercial enterprises concerned.

On the basis of the foregoing report the Council will consider submitted brands of enriched flour and accept those products which comply with its rules. The possibility of considering individual brands of nutritionally improved bread is being studied. With bread, as with enriched flour, the important problems for the industry are the establishment of satisfactory control over the nutritional and sanitary quality of the products and over the accuracy of the advertising claims.

11. Williams, R. D.; Mason, H. L.; Wilder, R. M., and Smith, B. F.: Observations on Induced Thiamine (Vitamin B<sub>1</sub>) Deficiency in Man, *Arch. Int. Med.* 66: 785 (Oct.) 1940.

12. Carpenter, Rowena S., and Stiebeling, Hazel K.: Diets to Fit the Family Income, *Farmers' Bull.* 1757, United States Department of Agriculture, Bureau of Home Economics, 1936.

13. Williams, R. R.: Cereals as a Source of Vitamin B<sub>1</sub> in Human Diets, *Cereal Chem.* 16: 301 (May) 1939.

# THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, JUNE 28, 1941

## NATIONAL NUTRITION

Almost daily it is becoming more apparent that those nations are most likely to survive which will be able to keep their people and armies supplied with the essentials of the diet necessary for health and growth. Hunger is a devastating phenomenon. Some one with a genius for phraseology has classified hunger into hollow hunger and hidden hunger. Hollow hunger is the form induced by the absence of enough food; hidden hunger occurs in people who satiate themselves with vast quantities of food and fail to realize that certain minimal amounts of protein, carbohydrates, fats, mineral salts and vitamins are essential to health. Here in America, most prosperous of all the nations in the world, both types of hunger are apparent. Statistics on nutrition have been made available based on studies of selected groups in various portions of the country. Some of the conclusions drawn from these figures are hardly warranted by the available evidence but are apparent exaggerations for the purpose of stimulating action. No doubt every one has some malnutrition, if the term is defined as an error of nutrition rather than as under-nutrition.

As a result of the National Nutrition Conference for Defense, doctors, dentists, nurses, home economists, social workers, food technologists, professional nutritionists, farmers, millers, bakers, canners, dairymen, wholesalers, retailers and consumers are beginning to be inspired with the need for better knowledge of nutrition. Indeed, most of the addresses delivered at the National Nutrition Conference for Defense were inspirational rather than scientific, planned, no doubt, by the representatives of the government who for the most part occupied the program, with the definite view of urging people not only to know more about food but to eat more scientifically. Today the situation in nutrition is like an inverted pyramid. At the bottom is the small body of medical scientists, food economists, nutritionists and educators who possess the necessary knowledge for the improvement of national nutrition. The pyramid

expands upward through producers and purveyors of foods to manufacturers of prepared foods and through wholesale and retail distributors; at the broad top are the consumers. This is the type of pyramid which usually falls unless more and more attention is given to the tiny point on which it rests. This point must be broadened; at this point the greatest support and expansion are needed.

No doubt with these ideas in mind, the House of Delegates of the American Medical Association, at the annual session just concluded in Cleveland, adopted the following resolution:

*Resolved*, That the House of Delegates of the American Medical Association expresses its approval of the general objectives of the National Nutrition Conference for Defense called by the President of the United States and specifically endorses the following recommendations:

1. That research in nutrition be encouraged, with an aim primarily toward (a) improvement of presently known chemical and biologic procedures for estimating the amounts of the essential nutrients in foods and their physiologic availability; (b) more refined technic for the detection of nutritional deficiency states, especially in the subclinical degrees of intensity, and (c) more precise determination, for each of the nutrients, of the optimum and minimum requirements of human subjects under varying conditions;
2. That special attention be paid to the diets and nutritional status of all workers in industry and particularly of those most directly concerned with the national defense effort;
3. That, in providing an adequate diet for pregnant and lactating women and for children, the necessity be appreciated for taking into consideration the whole family situation and the limitations of the budget;
4. That closer cooperation between medical and public health groups and other agencies interested in nutrition be established in order that effective local action may be taken;
5. That medical societies, dental societies and health authorities be represented on all state and community nutrition committees and that medical groups take an increasingly active part in organizing, sponsoring and cooperating in nutrition programs;
6. That efforts be made to stimulate greater interest in nutritional problems among general practitioners and, with this in view, that opportunity for postgraduate training in nutrition be made more widely available, and finally, but vastly more important,
7. That schools of medicine give greater thought to the teaching of nutrition.

This resolution is requested to emphasize particularly the importance of the first clause, which stresses three basic types of research which need to be intensified and expanded at this time. Without this knowledge, the drive for improved research will never be quite adequate. Until scientific methods for diagnosing subclinical degrees of nutritional deficiency are improved, evaluation of such deficiencies is uncertain. Without precise knowledge of the optimal and minimal requirements of essential ingredients under varying conditions, scientific feeding is difficult. Without satisfactory technics for determining the amounts of the essential nutrients available in natural foods, physicians will have to depend on prepared products rather than on natural foods to insure consumption of adequate amounts of essential substances.

The immediate outcome of the National Nutrition Conference for Defense has been largely an inspiration for better teaching of the available information. When educators discover the inadequacies of the available information they are likely to diminish their efforts. The times require increased emphasis on research of a scientific type, such as has already been mentioned and, at the same time, scientific studies dealing with distribution, consumption and inadequacies in the American diet.

#### PLASMA PROTEINS AND THE LIVER

The recent increased interest in the importance of plasma in the treatment of surgical shock has focused attention again on the question of the origin of the proteins in the plasma. Unlike tissue proteins, which are manufactured by each cell for its own purposes, the plasma proteins must be synthesized and excreted into the circulating blood, perhaps in the same manner as are hormones. Many physiologists believe that the liver is the main if not the sole manufactory for one or more of the plasma proteins. Certainly the albumin fraction of the plasma is frequently low in serious hepatic disease. In a brief but provocative discussion entitled "The Liver Proteins," J. Murray Luck<sup>1</sup> asserts that fibrinogen, an important protein fraction of plasma, undoubtedly originates in the liver. The evidence of the origin of albumin and globulin is conflicting in spite of many experimental and clinical studies. Luck, in his monograph, suggests that "There is great need of series of investigations in which the blood plasma and several organs receive simultaneous study with the object of determining whether qualitative or quantitative changes in the plasma proteins are accompanied by corresponding changes in the proteins of an organ."

This experiment has now been carried out in respect to the liver. In a large series of dogs Elman and Heifetz<sup>2</sup> by dietary means produced nearly a 50 per cent fall in the albumin fraction of the plasma. There was no change in the concentration of globulin, thus confirming the original observations of Weech and his co-workers.<sup>3</sup> Biopsies of the livers in these animals revealed a startling and progressive histologic and chemical change. As the hypoalbuminemia became more pronounced a corresponding fall in the protein content of the liver occurred, the cells becoming more and more vacuolated, so that in six weeks nearly all of the stainable cytoplasm became clear and transparent. The water content increased during this period of observation, although fat and glycogen stains and analyses failed to reveal any deviation from the normal. The St. Louis investigators infer from their

studies that a correlation is thus established between the albumin concentration of the blood and the protein concentration of the liver. Although this does not necessarily mean that the liver is the site of manufacture or storage of this blood protein, it must be, they say, an important "station in the assembly line for the production of serum albumin."

Of practical significance is the therapeutic implication of these observations. Elman and Heifetz found definite evidence of impairment of liver function in these protein-depleted animals. That carbohydrate is essential for maintaining the function of the liver and safeguarding it against hepatic poisons has been known for decades. The importance of protein is now apparent; indeed, experimental studies from other quarters have shown how dietary protein may protect the liver against the poisonous effects of chloroform and of arsenic<sup>4</sup> as well as or even better than carbohydrate. Thus the relationship of the liver to plasma protein would seem to be a dual one. To maintain efficiency of the liver, it is necessary to guard against protein depletion. To maintain plasma protein, the liver must be in excellent physiologic state.

#### PROGRESS IN CONTROL OF TRICHINOSIS

Progress in the epidemiologic control of trichinosis is reported by McNaught and Zapater<sup>1</sup> of Stanford University Medical School. Statistics collected from human necropsies a few years ago suggested that nearly 18 per cent<sup>2</sup> of all American adults are infected with *Trichinella spiralis*. This percentage varies in different localities, an incidence of 27.6 per cent being recorded in Boston,<sup>3</sup> 24 per cent in San Francisco,<sup>4</sup> falling to as low as 3.5 per cent for New Orleans,<sup>5</sup> with other cities taking an intermediate position. In each locality the incidence of trichinosis in man is closely correlated with that in the local pork supply; hogs in the vicinity of Boston, for example, showed an incidence as high as 18 per cent, with the percentage falling to from 0.1 to 0.8 for New Orleans.<sup>6</sup> This percentage is apparently determined by local methods of feeding; the highest percentage of swine trichinosis is associated with the feeding of garbage or slaughterhouse offal, and the lowest with feeding of grain or in regions in which the hogs are allowed to run wild in the fields or woods.

4. Messinger, W. J., and Hawkins, W. B.: Arsenphenamine Liver Injury Modified by Diet: Protein and Carbohydrate Protective, but Fat Injurious, *Am. J. M. Sc.* **199**: 216 (Feb.) 1940. Miller, L. L., and Whipple, G. H.: Chloroform Liver Injury Increases as Protein Stores Decrease, *ibid.* **199**: 204 (Feb.) 1940. Goldschmidt, S.; Vars, H. M., and Ravdin, I. S.: Influence of Foodstuffs upon Susceptibility of Liver to Injury by Chloroform and Probably Mechanism of Their Action, *J. Clin. Investigation* **18**: 277 (May) 1939.

1. McNaught, J. B., and Zapater, E. M.: *Proc. Soc. Exper. Biol. & Med.* **45**: 701 (Nov.) 1940.

2. Committee appointed by Pollock, R. C.: Trichinosis and Nonclinical Infections with *Trichinella Spiralis*, *J. A. M. A.* **114**: 35 (Jan. 6) 1940.

3. Queen, F. B.: *J. Parasitol.* **18**: 128 (Dec.) 1931.

4. McNaught, J. B., and Anderson, E. V.: Incidence of Trichinosis in San Francisco, *J. A. M. A.* **107**: 1446 (Oct. 31) 1936.

5. Hinman, E. H.: *New Orleans M. & S. J.* **88**: 445 (Jan.) 1936.

6. Harrell, G. T., and Johnston, C.: *South. M. J.* **32**: 1021 (Nov.) 1939.

1. Luck, J. M.: The Liver Proteins, in Weedham, J., and Green, D. E.: *Perspectives in Biochemistry*, Cambridge, University Press, 1937.

2. Elman, Robert, and Heifetz, Carl J.: Experimental Hypoalbuminemia, *J. Exper. Med.* **73**: 417 (March) 1941.

3. Weech, A. A.; Goettsch, E., and Reeves, E. B.: Nutritional Edema in the Dog, *J. Exper. Med.* **61**: 299 (March) 1935.



Three years ago Hobmaier and Geiger<sup>7</sup> examined 93 garbage-fed hogs offered for sale in the San Francisco market and found 15 per cent infected with trichinosis. At that time the only politically feasible method of reducing this percentage was rodent control. This was introduced and encouraged in the hog ranches of the San Francisco Bay region, the main source of supply for the San Francisco market. Since the introduction of this hygienic measure the percentage infection of garbage-fed hogs received by San Francisco abattoirs has fallen to 4.04.<sup>1</sup> Rodent control apparently is a statistically verifiable method of reducing trichinosis percentage in garbage-fed swine.

Much more effective methods have been politically feasible in other countries. In the Hawaiian Islands, for example, 13.6 per cent of the wild hogs are infected with *Trichinella*. This has been reduced to 0.3 per cent in hogs kept in concrete or wooden pens and fed cooked garbage.<sup>8</sup> In Canada all garbage-feeding hog ranches are required to be licensed and inspected, and all garbage is cooked prior to feeding. The inspection includes rodent control. Recent data reported by Cameron<sup>9</sup> have shown that swine trichinosis has been reduced to 0.2 per cent by the Canadian method. This is less than one twentieth of the present percental infection in San Francisco. As soon as it becomes politically feasible, complete elimination of infected pork should be possible in American markets.

## Current Comment

### INTERSTITIAL EMPHYSEMA

Until recently, little attempt has been made to visualize the pattern which is formed in the pulmonic interstitial tissue by the presence of air. Investigations of the excised fresh lung of the calf after overinflation by air indicated, according to Macklin,<sup>1</sup> that air from the alveoli invades the pulmonic connective tissue and forms a characteristic pattern in the septums and vascular sheaths. When the septums between subdivisions of the lung become filled with air bubbles they stand out prominently both on the external surfaces of the lobes and on the cut surfaces of slices taken through the fixed lobes of all regions. These bubble-filled plates block off polyhedral areas of lung substance of variable shape and size. The sheaths of the pulmonary vessels are also distended by large columns of air bubbles, and intercommunications between the air pockets of the septums and vascular sheaths are noted. The pattern of this aberrant air-containing tissue is like that of the

human lung with interstitial emphysema. During the time air was being forced into the overdistended calf lung by way of the trachea it bubbled forth freely from the lung routes and could be seen to be coming from the vascular sheaths. Macklin concluded that the region of leakage or transfer of air from the alveoli of the connective tissue of the vascular sheaths is that of the terminals of the pulmonary arteries and veins. The condition arising from interference of air in the lung mediastinum and extensions therefrom with the vital functions of respiration and air circulation he calls "air block." This work and the conception of "air block" add much to the understanding of the pathogenesis of interstitial emphysema.

### GAS AND DUST MASKS

The Bureau of Mines of the United States Department of the Interior is continuing its investigations of respiratory protective equipment. In the Scientific Exhibit at the annual session of the American Medical Association in Cleveland the bureau displayed approved respiratory protective appliances and gave information regarding their specialized use. Appliances which meet the requirements of the bureau are included on an approved list which is available for the asking. These devices are called respirators, gas masks, supply air respirators (hose mask), abrasive blasting helmets, hoods and masks. They cover either the entire head or merely the nostrils and mouth and are equipped with filters of high filtering efficiency or with an air line connected to a source of fresh air supply. In the case of a gas mask the contaminated air passes through a canister containing a chemical absorbent compound. These devices are intended for removal of contaminants which may render atmosphere irrespirable: either gaseous substances or particulate matter. The efficiency and length of service of the gas mask depend largely on the chemical contents of the canister. Six hour tests in laboratories are made to hasten the chemical stability of the absorbent at various relative humidities and temperatures. The masks are subjected to a variety of gases, such as carbon monoxide, sulfur dioxide, phosgene and carbon tetrachloride. The respirator or filter type is tested against relatively high concentrations of quartz dust, lead dust, chromic acid mist, siliceous mist, lead paint mist or lead fume. The filter must be able to retain considerable dust without due increase in resistance to breathing. Supplied air respirators provide an atmosphere of fresh air around the nose and nostrils of the wearer from a source which is outside the contaminated zone. For this type an air line is essential and must be air tight. These devices are tested under various conditions in the laboratory and also under actual use (man tests). The man tests are regarded important, and the final decision depends on their outcome. Those physicians who are confronted with diseases caused by fumes or heavy dust concentrations such as silicosis will undoubtedly wish to secure from the Bureau of Mines, Washington, D. C., its list of approved respirators.

7. Hobmaier, M. D., and Geiger, J. C.: *Am. J. Pub. Health* 28: 1203 (Oct.) 1938.

8. Alicata, J. E.: *Pub. Health Rep.* 53: 384 (March) 1938.

9. Cameron, T. W. M.: *Canad. J. Research (Sect. D)* 18: 83 (March) 1940.

1. Macklin, C. C.: *The Pattern of Interstitial Emphysema Induced in the Excised Lung of the Calf by Overinflation*, *Tr. Royal Society of Canada*, section V, 1940, p. 69.

## MEDICAL PREPAREDNESS

*In this section of The Journal each week will appear official notices by the Committee on Medical Preparedness of the American Medical Association, announcements by the Surgeon Generals of the Army, Navy and Public Health Service, and other governmental agencies dealing with medical preparedness, and such other information and announcements as will be useful to the medical profession.*

### ACTIVE IMMUNIZATION AGAINST TETANUS BY VACCINATION WITH TETANUS TOXOID

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Office of the Surgeon General  
Washington

The following instructions will govern the administration of tetanus toxoid to military personnel in situations in which the use of this agent is specifically authorized by the War Department:

1. *Personnel to Be Vaccinated.*—(a) When authorized by the War Department, all military personnel on active duty will be vaccinated and revaccinated with tetanus toxoid as prescribed.

(b) Civilian employees subject to field service with the Army, including those on transports and in the mine planter service, dependents of military personnel and others residing at military stations may be vaccinated similarly against tetanus when such vaccination is requested by them.

(c) The active immunization against tetanus of persons who are in poor physical condition or are suffering from acute disease may be temporarily deferred when, in the opinion of the responsible medical officer, such vaccination would be detrimental to health.

(d) There is no contraindication to giving the first dose of this toxoid concurrently with triple typhoid and smallpox vaccines.

2. *Tetanus Toxoid.*—(a) Type and Source: The material used for vaccinations against tetanus will be liquid tetanus toxoid (plain), prepared according to specifications approved by the United States Public Health Service and the Surgeon General of the Army. It will be supplied on requisition by the Medical Supply Officer, New York General Depot, Brooklyn, in 30 cc. and 1 cc. containers.

(b) Storage and Shipment: Tetanus toxoid should be stored at a temperature between 2 and 5 C. Exposure to room temperature causes a gradual deterioration of the toxoid. Freezing may cause breakage of the containers and discoloration of the fluid but does not otherwise render the toxoid unfit for use.

3. *Initial Vaccination with Toxoid.*—The initial vaccination consists of a series of three subcutaneous injections of tetanus toxoid (plain) 1 cc. each, administered with intervals of not less than three or more than four weeks, and preferably with intervals of three weeks, between doses. The injection should be made subcutaneously in the deltoid region of the arm. The completion of the series of three injections included in this "initial vaccination" increases the individual's immunity, so that whenever he is subjected to the stimulation of a subsequent injection of toxoid there will be produced in his body sufficient antitoxin to protect against tetanus.

4. *Subsequent Vaccination with Tetanus Toxoid.*—After the completion of the three injections included in the "initial vaccination," a single "stimulating" dose of 1 cc. of tetanus toxoid will be injected subcutaneously at the times indicated:

(a) Under normal conditions a "stimulating" dose will be administered at the end of the first year only, regardless of duration of service.

(b) In time of war a "stimulating" dose will be administered during the month prior to departure for a theater of operations unless such departure is within a period of six months subsequent to the "stimulating" dose prescribed in a.

(c) *Emergency Dose of Toxoid:* In addition to the initial and subsequent vaccinations, an emergency "stimulating" dose will be administered immediately:

(1) To each individual who incurs a wound or severe burn on the battlefield.

(2) To patients undergoing secondary operations or manipulations of old wounds when deemed advisable by the responsible medical officer.

(3) To others who incur punctured or lacerated nonbattle wounds, powder burns or other conditions which might be complicated by the introduction of *Clostridium tetani* into the tissues.

5. *Passive Immunization Against Tetanus by the Use of Tetanus Antitoxin.*—Tetanus antitoxin will be used for the treatment of clinical tetanus and, when indicated, for the prevention of tetanus in persons who have not previously been actively immunized with tetanus toxoid. The administration of tetanus antitoxin will be limited:

(a) To patients presenting evidence of clinical tetanus.

(b) To persons who incur wounds or other conditions which necessitate their protection against tetanus but who have not previously completed the initial vaccination with tetanus toxoid as directed in paragraph 3.

(c) To wounded persons who may have been previously vaccinated but whose records of vaccination are lost or not available.

Persons referred to in b and c will be immediately immunized passively with adequate amounts of tetanus antitoxin and at the same time will be vaccinated with tetanus toxoid as directed in paragraph 3.

6. *Records of Tetanus Immunization.*—When a person is immunized against tetanus, the senior medical officer of the command will be responsible for the proper recording of the same as directed.

(a) *Vaccination with Tetanus Toxoid:* A record in duplicate will be made on Medical Department Form Number 81 (Immunization Register) of the dates on which each of the individual injections of tetanus toxoid, both initial and subsequent, are administered and these notations will be initialed by the responsible medical officer. The Immunization Register will be disposed of as prescribed in paragraph 6 AR 40-215. On completion of the three injections of tetanus toxoid required for the "initial" vaccination, in paragraph 3, a permanent record will be made by stamping clearly on the individual's identification tag the letter T followed by figures indicating the year in which immunization was completed. An additional date will in a similar manner record the administration of the "stimulating" dose. Thus T40-41 would indicate that the person completed his initial vaccination in 1940 and received a "stimulating" dose a year later, in 1941. These data will be stamped in the space immediately to the right of the serial number. Owing to lack of space on the identification tag, the month in which the vaccinations are completed cannot be recorded thereon. However, this information will appear in the Service Record and the Immunization Register of the individual, where it will afford a basis for determining when the "stimulating" dose is to be given. The remaining space on the identification tag may be required for the recording of the individual's blood type.

In case the identification tag is lost, the record of tetanus vaccination as shown on the Immunization Register or on the Service Record will be stamped on the new tag. The information concerning tetanus immunization recorded on the identification tag must be accurate, as later it may afford the only basis for determining what treatment is required for a wounded individual.

By order of the Surgeon General:

JOE A. BAIN, M.D.  
Captain, Medical Corps,  
Acting Assistant Executive Officer.

## ARMY RESERVE OFFICERS ORDERED TO ACTIVE DUTY FOURTH CORPS AREA

The following additional medical reserve corps officers have been ordered to active duty by the Commanding General, Fourth Corps Area, which comprises the states of Tennessee, North Carolina, South Carolina, Alabama, Georgia, Mississippi, Florida and Louisiana:

BOOTH, Thomas Eugene, 1st Lieut., Montgomery, Ala., Fort Bragg, N. C.  
CHRISMAN, Reuben B., Jr., 1st Lieut., Nashville, Tenn., Camp Forrest, Tenn.  
COLES, William Cruse, 1st Lieut., Augusta, Ga., Fort Benning, Ga.  
FARRIOR, James H., 1st Lieut., Montgomery, Ala., Fort Bragg, N. C.  
GAVIN, James Foster, 1st Lieut., Fort Gaines, Ga., Fort Bragg, N. C.  
KIMATA, Harold Tamaki, 1st Lieut., New Orleans, Fort Bragg, N. C.  
McFARLAND, James J., Jr., 1st Lieut., Lebanon, Tenn., Camp Claiborne, La.  
MARCY, John Orburn, 1st Lieut., Bristol, Tenn., Camp Livingston, La.  
WESTERFIELD, James A., 1st Lieut., Merigold, Miss., Camp Claiborne, La.

### Orders Revoked

ALVERSON, Reginald C., 1st Lieut., Greer, S. C.  
ASLING, Clarence W., 1st Lieut., Nashville, Tenn.  
AUERBACH, Stewart H., Captain, Augusta, Ga.  
BARFIELD, William E., 1st Lieut., Jackson, Ga.  
BENNETT, William M., Captain, Ruffin, S. C.

## FIFTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Fifth Corps Area, which comprises the states of Ohio, West Virginia, Indiana and Kentucky:

ABBOTT, Osler A., 1st Lieut., Cincinnati, Fort Knox, Ky.  
COERS, Burt M., 1st Lieut., Circleville, Ohio, Fort Thomas, Ky.  
DOLE, John A., Jr., 1st Lieut., Ironton, Ohio, Fort Benjamin Harrison, Ind.  
DUTTON, Arthur S., 1st Lieut., Put-in-Bay, Ohio, Fort Knox, Ky.  
HOFFMAN, Henry L., 1st Lieut., Cleveland, Fort Knox, Ky.  
LAMEY, James L., 1st Lieut., Anderson, Ind., Fort Benjamin Harrison, Ind.

## SEVENTH CORPS AREA

The following additional medical reserve corps officers have been ordered to extended active duty by the Commanding General, Seventh Corps Area, which comprises the states of North Dakota, South Dakota, Minnesota, Nebraska, Iowa, Kansas, Missouri, Arkansas and Wyoming:

CLARKE, William Oscar, 1st Lieut., Minneapolis, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
DOBIAS, Stephen Glenn, 1st Lieut., Chelsea, Iowa, Corps Area Service Command U. S. Disciplinary Barracks, Fort Leavenworth, Kan.  
EUBANK, William Richards, 1st Lieut., Kansas City, Kan., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
LEWIS, George Kenneth, Major, Garden City, Kan., 63d Infantry, Fort Leonard Wood, Mo.  
SMITH, William Russell, 1st Lieut., Carthage, Mo., Corps Area Service Command Station Hospital, Fort Leavenworth, Kan.  
WHITE, Charles Herbert, 1st Lieut., Kansas City, Mo., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.

## THE MEDICAL RESERVE CORPS

Almost one half of the reserve officers of the Army Medical Corps have been ordered to extended active duty, principally in the lower ranks. As of April 30, there were 12,126 medical reserve officers, of whom 5,891 were on extended active duty. However, only 9 out of 150 reserve colonels had been ordered to active duty and only 80 out of 349 lieutenant colonels. The remainder of the active list shows 270 out of 590 majors; 1,168 out of 1,914 captains, and 4,364 out of 9,123 lieutenants. The number of medical reserve officers available has been reduced by more than 1,000 during the past few months by resignations and physical examinations.

DANIEL, Rollin A., Jr., Captain, Nashville, Tenn.  
ELDRIDGE, Jesse C., Lieut. Col., Chattanooga, Tenn.  
FARRAGUT, Loyall D., Captain, Jackson, Tenn.  
FULENWIDER, John O., Jr., 1st Lieut., Pageland, S. C.  
GREEN, Edgar V., 1st Lieut., Youngsville, N. C.  
GRIFFIN, Eugene L., 1st Lieut., Augusta, Ga.  
HILL, Thurman K., 1st Lieut., Decatur, Ga.  
JONES, Andrew M., 1st Lieut., Athens, Ga.  
LYLE, Philip Lewis, 1st Lieut., Clarksville, Tenn.  
MacPHERSON, Ford J., 1st Lieut., Baltimore.  
MASON, James Monroe, III, 1st Lieut., Birmingham, Ala.  
MASTERSON, Rodney G., 1st Lieut., Alexandria, La.  
MURPHY, Robert J., Jr., 1st Lieut., Sanatorium, N. C.  
PARKS, Harry, 1st Lieut., Atlanta, Ga.  
PETERSON, Bedford F., 1st Lieut., Knoxville.  
POWELL, William F., 1st Lieut., New Orleans, La.  
RAMEY, Daniel R., Jr., 1st Lieut., Holt, Ala.  
RUSSELL, John Charles, 1st Lieut., Cleveland, Miss.  
SANDUSKY, William R., Captain, Pensacola, Fla.  
SHEPARD, Richard C., Captain, LaFayette, Ga.  
STANDER, Alvin A., 1st Lieut., Baton Rouge, La.  
STEGALL, Oscar B., 1st Lieut., Memphis, Tenn.  
STEWART, James B., 1st Lieut., Milledgeville, Ga.  
THOMAS, Paul Jasper, 1st Lieut., New Orleans.  
VINSANT, Lowell E., 1st Lieut., Knoxville, Tenn.  
VAN HOOSER, John L., 1st Lieut., Smithville, Tenn.  
WEAVER, Thomas S., 1st Lieut., Nashville, Tenn.  
WRIGHT, Leonard D., 1st Lieut., Memphis, Tenn.

LAWN, Harold J., 1st Lieut., Marion, Ind., Fort Benjamin Harrison, Ind.  
LYNCH, Cornelius G., Jr., 1st Lieut., Toledo, Ohio, Fort Knox, Ky.  
McKEE, Wilbur F., 1st Lieut., Bryan, Ohio, Fort Knox, Ky.  
SUBLETT, Daniel V., 1st Lieut., Lexington, Ky., Fort Knox, Ky.  
WONER, John W., 1st Lieut., Linton, Ind., Huntington, W. Va.

### Relieved from Active Duty

CHRENKA, Paul, 1st Lieut., Cleveland, at Fort Thomas, Ky.  
OCKULY, Edward F., 1st Lieut., Toledo, Ohio, Fort Knox, Ky.

### Orders Revoked

GEIGER, Franklin R., 1st Lieut., Cincinnati.

### Orders Revoked

ALDERSON, Clair Milton, 1st Lieut., Dodge City, Kan., 53d Evacuation Hospital, Camp San Luis Obispo, Calif.  
CLINE, Harold Hadley, 1st Lieut., Piedmont, Mo., C. A. S. C. Station Hospital, Camp J. T. Robinson, Ark.  
CLINTON, Lloyd Brandon, Captain, Carthage, Mo., C. A. S. C. Induction Station, Fort Leavenworth, Kan.  
COPE, Josef Shelton, Captain, Lexington, Mo., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.  
DONOHUE, Edmund Stephen, 1st Lieut., Sioux City, Iowa, Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.  
EDERER, John Joseph, 1st Lieut., Mahanomen, Minn., 9th Army Corps Troops, Fort Lewis, Wash.  
FRITSCH, Carl J., 1st Lieut., New Ulm, Minn., Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
GALEOTA, William Richard, 1st Lieut., Fort Jackson, S. C., C. A. S. C. Induction Station, Fort Snelling, Minn.  
GILFILLAN, Clarence David Neuton, 1st Lieut., Eldon, Iowa, Corps Area Service Command Engineer Replacement Training Center Infirmary, Fort Leonard Wood, Mo.

KIMBALL, Gilbert Leslie, 1st Lieut., DeQueen, Ark., Corps Area 3d Infantry, Fort Leonard Wood, Mo.  
LOVELACE, George Martin, 1st Lieut., Big Horn, Wyo., Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.  
MALES, Albert Conrad, 1st Lieut., Lewisville, Ark., Engineer Replacement Center Infirmary, Fort Leonard Wood, Mo.  
MOERKE, Robert Frank, 1st Lieut., Burlington, Iowa, 35th Division, Camp J. T. Robinson, Ark.  
MOORE, Robert Hollingsworth, 1st Lieut., M. R. C., Lansing, Kan., Corps Area Service Command Induction Station, Fort Leavenworth, Kan.  
NEEL, Harry Bryan, 1st Lieut., Albert Lea, Minn., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
NIELSON, Arthur Lawrence, 1st Lieut., Harlan, Iowa, 85th Field Artillery, Camp Roberts, Calif.  
OSTEN, Burdette Hubert, 1st Lieut., Northwood, Iowa, Corps Area Service Command Reception Center, Fort Snelling, Minn.  
PALLETT, Harold Anthony, 1st Lieut., Kansas City, Mo., Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo.  
PALMER, Harry Allen, 1st Lieut., Blackduck, Minn., Corps Area Reception Center, Fort Snelling, Minn.  
RAE, Harold Burton, 1st Lieut., Torrington, Wyo., Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyo.  
ROLIG, David Howard, 1st Lieut., Howard Lake, Minn., Corps Area Service Command Reception Center, Jefferson Barracks, Mo.  
TROWBRIDGE, Barnard Cole, 1st Lieut., Kansas City, Mo., Corps Area Service Command, Station Hospital, Fort Leonard Wood, Mo.  
WADD, Clifford Theodore, 1st Lieut., Janesville, Minn., 166th Station Hospital, Harbor Defenses, San Diego, Calif.  
WHITNEY, Richard Aurie, 1st Lieut., Cambridge, Minn., 30th Field Artillery, Camp Roberts, Calif.

WOERN, William Henry, 1st Lieut., England, Ark., Corps Area Service Command Induction Station, Fort Snelling, Minn.  
ZAESKE, Edward Vernon, 1st Lieut., Charter Oak, Iowa, 1st Medical Regiment, Fort Ord, Calif.

#### Relieved from Extended Active Duty

BUTT, William Jackson, 1st Lieut., Fayetteville, Ark., 214th General Hospital, Camp J. T. Robinson, Ark.  
CAPETTI, Alexander Pasquale, 1st Lieut., Crane, Mo., Corps Area Service Command Induction Station, Fort Des Moines, Iowa (relieved at Fort Des Moines, Iowa).  
EGLEY, Loren Edward, 1st Lieut., Maryville, Mo., 85th Field Artillery, Camp Roberts, Calif.  
KURTH, Clarence Joseph, 1st Lieut., Council Bluffs, Iowa, Corps Area Service Command Station Hospital, Fort Leonard Wood, Mo. (relieved at Fort Crook, Neb.).  
PALMERTON, Ernest Sterling, 1st Lieut., Albert Lea, Minn., 85th Field Artillery, Camp Roberts, Calif.  
PLATZ, John Herschel, Captain, Carrollton, Mo., 155th Station Hospital, Camp Roberts, Calif.  
SAUNDERS, Everett Lewis, 1st Lieut., Independence, Mo., Corps Area Service Command Induction Station, Jefferson Barracks, Mo.  
SCHWARTZ, Herbert F., 1st Lieut., M. R. C., Koch, Mo., Lawson General Hospital, Atlanta, Ga.  
SENN, Emmett Jacob, 1st Lieut., M. R. C., Herculaneum, Mo., Corps Area Service Command Replacement Center Infirmary, Fort Riley, Kan.  
STERLING, Allen Fred, 1st Lieut., Norway, Iowa, Corps Area Service Command Induction Station, Jefferson Barracks, Mo.

### HEART SOUND RESEARCH TO AID THE SELECTION OF PILOTS

Aviation medicine is rapidly advancing and multiplying its instruments for the study of the reactions of the human body to various flight conditions. The latest instrument to come under study for adaptability to pilot testing is one that records the sound waves of the heart beat at the same time at which it records the electrocardiogram. With this instrument a doctor can obtain a graphic picture of the heart beat which in conjunction with the electrocardiogram will give an objective record for further study, reinforcing the usual examination with the stethoscope.

Experimental studies to develop a method to use this device in selecting candidates for pilot training are now in progress. The Work Projects Administration in cooperation with the Civil Aeronautics Administration has organized a research project to evaluate the heart sound record in order to determine its usefulness in mass examinations of candidates applying for training as pilots. The project will endeavor to set up a set of standards of heart sounds for comparison with the records of individual candidates.

The studies will follow plans outlined by Dr. Dean R. Brimhall, CAA Director of Research, and Dr. Raymond Franzen, Statistical Consultant to the CAA. WPA workers will be trained in the handling of the instruments and the correct manner of taking heart sound records of the persons examined experimentally in establishment of the scale.

These records, following photographic processing, will be examined and measured statistically, as would any biometric measure, to determine the incidence or range of occurrence within a normal population of the various elements of heart sounds. The graphic heart records also will be examined by a competent cardiologist.

The scale to be thus set up for comparison with the stethograms of individual candidates for pilot training should be valuable in eliminating candidates whose heart sound records indicate that they would not be able to stand the physical strain of constant flying.

This research will be followed by other studies on the effects of protracted flights and various flight conditions on the heart. With the objective records of heart action, doctors will be able to study the cardiac cycle of individual pilots over a period of years.

The project in New York which is conducting this heart sound research is a unit of the WPA National Defense Research and Records Assistance Project.

This work when completed will be incorporated into the medical examinations of the Civilian Pilot Training Program of the CAA, which is contributing pilots in large numbers to the Army and Navy for further training in military aviation.

### SYPHILIS AMONG SELECTEES AND VOLUNTEERS

The Division of Venereal Diseases of the United States Public Health Service announced on June 12 that unpublished analyses of serologic and clinical examinations of 1,070,000 selectees and volunteers, as of April 15, 1941, indicate a total of about 48,500 cases of syphilis. For white selectees and volunteers for whom reports were submitted the rate was 18.5 per thousand; for Negroes, 241.2 per thousand.

The Division of Venereal Diseases recommends that each state and local health department set in motion a comprehensive prehabilitation education program for selectees which would involve as a minimum the distribution of a leaflet to all registrants at the time of the second registration, July 1, followed by concerted efforts at preclassification blood tests. At the time of registration and following, posters can be placed, Asst. Surg. Gen. R. A. Vonderlehr, stated, at strategic points urging men required to register to have a blood test for syphilis and a complete physical examination.

### HOFF HALL AT CARLISLE BARRACKS

Another unit in the extensive program of construction at the Medical Field Service School, Carlisle Barracks, Pa., is the new Hoff Hall, the cornerstone of which was laid with appropriate ceremony, June 26. The old building by this name was razed last year to make way for the construction of quarters for officers. The new Hoff Hall, which contains lecture rooms, a large library, amphitheater and offices, is made of native limestone quarried on the military reservation. Hoff Hall is named in memory of a distinguished medical officer, Col. John Van Rensselaer Hoff, who was one of the earliest medical officers of the United States Army to realize the importance of training medical officers as well as enlisted men in field duties, drill and tactics. Colonel Hoff is said to have organized the first detachment of the hospital corps in the army in 1887 and the first company of instruction in the hospital corps in 1891. Among many assignments during his long army service were that of assistant surgeon general, chief surgeon in the Philippines and other departments, and observer with the Russian army in the Russo-Japanese War.

The Medical Field Service School was established soon after the first World War, and through the intervening years many classes of army officers have graduated. When the present emergency arose, the regular classes were abandoned and, instead, classes of about five hundred medical officers a month have been put through the school. These intensive training courses necessitated the use of temporary barracks and other buildings, needs for which the new Hoff Hall school building will answer to a great extent.

# ORGANIZATION SECTION

## PROCEEDINGS OF THE CLEVELAND SESSION

MINUTES OF THE NINETY-SECOND ANNUAL SESSION OF THE AMERICAN MEDICAL ASSOCIATION, HELD IN CLEVELAND, JUNE 2-6, 1941

### MINUTES OF THE SECTIONS

#### SECTION ON PRACTICE OF MEDICINE

WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9:10 by the chairman, Dr. Fred M. Smith, Iowa City.

Dr. Frank H. Bethell, Ann Arbor, Mich., read a paper on "Lymphatic (Lymphogenous) Leukemia: Diagnostic and Therapeutic Considerations Based on an Analysis of Its Morphologic and Clinical Variants."

Dr. B. K. Wiseman, Columbus, Ohio, read a paper on "Important Facts Additive to the Clinical and Hematologic Recognition of Atypical Lymphatic Leukemia."

Dr. C. P. Rhoads, New York, read a paper on "Clinical and Laboratory Studies of the Effect of Radioactive Phosphorus on Leukemia."

These three papers were discussed by Drs. Russell L. Haden, Cleveland; Shields Warren, Boston; Raphael Isaacs, Chicago; B. K. Wiseman, Columbus, Ohio, and C. P. Rhoads, New York.

Dr. Warfield T. Longcope, Baltimore, read the Frank Billings Lecture on "Sarcoidosis or Besnier-Bocock-Schaumann's Disease." Dr. Longcope was introduced by Dr. Walter L. Biering of Des Moines, Iowa, who gave a brief historical review of the Frank Billings lectures of previous years.

Dr. Ovid O. Meyer, Madison, Wis., read a paper on "Therapeutic Experiences in Hodgkin's Disease." Discussed by Drs. Raphael Isaacs, Chicago, and W. Edward Chamberlain, Philadelphia.

Dr. Merrill C. Sosman, Boston, read a paper on "Roentgen Observations in Hodgkin's Disease (Lymphoblastoma), Sarcoidosis and Erythema Nodosum." Discussed by Drs. Eugene P. Pendergrass, Philadelphia, and John W. Pierson, Baltimore.

THURSDAY, JUNE 5—MORNING

The following officers were elected: chairman, Dr. Roy W. Scott, Cleveland; vice chairman, Dr. G. K. Fenn, Chicago; secretary, Dr. William D. Stroud, Philadelphia; delegate, Dr. James E. Paullin, Atlanta, Ga.; alternate, Dr. William B. Breed, Boston; executive committee: Dr. William S. McCann, Rochester, N. Y.; Dr. Fred M. Smith, Iowa City, and Dr. Roy W. Scott, Cleveland; member of the American Board of Internal Medicine, Dr. Ernest E. Irons, Chicago.

Drs. Willis M. Fowler and A. P. Barer, Iowa City, presented a paper on "Blood Donors: Their Rate of Hemoglobin Regeneration."

Drs. Max M. Strumia and John J. McGraw, Bryn Mawr, Pa., presented a paper on "Blood Plasma: Its Place in the Practice of Medicine, with Special Consideration to the Problems of Preservation."

These two papers were discussed by Drs. Charles A. Doan, Columbus, Ohio; Paul I. Hoxworth, Cincinnati; Willis M. Fowler, Iowa City, and Max M. Strumia, Bryn Mawr, Pa.

Dr. Fred M. Smith, Iowa City, read the chairman's address, entitled "Concerning the Examination of the Heart for Military Service."

Drs. Paul S. Rhoads, W. H. Tucker and Benjamin Rappaport, Evanston, Ill., presented a paper on "Management of Scarlet Fever Contacts." Discussed by Drs. Arthur T. McCormack, Louisville, Ky.; Jesse G. M. Bullova, New York, and Paul S. Rhoads, Evanston, Ill.

Dr. Russell M. Wilder, Rochester, Minn., read a paper on "Nutrition: A Public Health Problem." Discussed by Dr. Tom D. Spies, Cincinnati.

Dr. Edward J. Stieglitz, Garrett Park, Md., read a paper on "Geriatrics in National Defense." Discussed by Dr. Edward L. Bortz, Philadelphia.

FRIDAY, JUNE 6—MORNING

A joint meeting was held with the Section on Pharmacology and Therapeutics.

Drs. Robert L. Levy, James E. Patterson, Thomas W. Clark and Howard G. Bruenn, New York, presented a paper on "The 'Anoxemia Test' as an Index of the Coronary Reserve: Serial Observations in Patients with Their Application to the Detection and Clinical Course of Coronary Insufficiency." Discussed by Drs. Roy W. Scott, Cleveland, Arlie R. Barnes, Rochester, Minn.; C. T. Burnett, Denver, and Robert L. Levy, New York.

Drs. George V. LeRoy and S. S. Snider, Chicago, presented a paper on "The Sudden Death of Patients with Few Symptoms of Heart Disease." Discussed by Drs. George K. Fenn, Chicago; Harold E. B. Pardee, New York, and George V. LeRoy, Chicago.

Dr. George Morris Piersol, Philadelphia, read a paper on "Physical Therapy in Internal Medicine." Discussed by Drs. John S. Coulter, Chicago; Ralph Pemberton, Philadelphia, and George Morris Piersol, Philadelphia.

Drs. George E. Fahr and J. S. LaDue, Minneapolis, presented a paper on "Therapeutic Efficiency of a Digitalis Glucoside, Lanatoside C, in Congestive Heart Failure with Normal Sinus Rhythm." Discussed by Drs. Arlie R. Barnes, Rochester, Minn.; William H. Bunn, Youngstown, Ohio; William D. Stroud, Philadelphia; J. S. LaDue, Minneapolis, and George E. Fahr, Minneapolis.

Drs. Jesse G. M. Bullova, Nathan H. Shackman and Daniel Stats, New York, presented a paper on "Chemotherapy of Pneumonias and Immunity Reactions." Discussed by Drs. William H. Kelley, Charleston, S. C.; Lynn T. Hall, Omaha; John W. Brown, San Francisco; Norman H. Plummer, New York, and Jesse G. M. Bullova, New York.

Dr. Albert H. Rowe, Oakland, Calif., read a paper on "Elimination Diets for the Diagnosis of Food Allergy." Discussed by Drs. Ralph G. Mills, Decatur, Ill.; C. N. Hensel, St. Paul; Joseph Muller, Worcester, Mass., and Albert H. Rowe, Oakland, Calif.



## SECTION ON SURGERY, GENERAL AND ABDOMINAL

WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Lloyd Noland, Fairfield, Ala.

Dr. Frederick F. Boyce, New Orleans, read a paper on "Carcinoma of the Stomach in a Large General Hospital."

Drs. Waltman Walters, H. K. Gray and James T. Priestley, Rochester, Minn., presented a paper on "Malignant Lesions of the Stomach: Importance of Early Treatment and Results."

These two papers were discussed by Drs. George T. Pack, New York; A. W. Oughterson, New Haven, Conn.; Robert Zollinger, Boston; Walter L. Palmer, Chicago, and Waltman Walters, Rochester, Minn.

Dr. J. Dewey Bisgard, Omaha, read a paper on "The Effect of Hot and Cold Applications to the Abdominal Wall and Also Hot and Cold Fluids Administered by Mouth on Gastric and Intestinal Secretory and Peristaltic Activity." Discussed by Drs. James M. Winfield, Detroit; Charles W. Mayo, Rochester, Minn., and J. Dewey Bisgard, Omaha.

Drs. Octa C. Leigh Jr. and Richard O. Diefendorf, New York, presented a paper on "The Miller-Abbott Tube in Surgery." Discussed by Dr. Grover C. Penberthy, Detroit.

Drs. R. Sterling Mueller and James E. Thompson, New York, presented a paper on "The Local Use of Powdered Sulfanilamide in Infections of the Peritoneal Cavity."

Drs. Howard C. Jackson and Frederick A. Collier, Ann Arbor, Mich., presented a paper on "The Use of Sulfanilamide in the Peritoneum: Experimental and Clinical Observations."

These two papers were discussed by Drs. Henry W. Cave, New York; James E. Thompson, New York; Alton Ochsner, New Orleans; Frederick A. Collier, Ann Arbor, Mich.; F. L. Reichert, San Francisco; Misch Casper, Louisville, Ky., and R. Sterling Mueller, New York.

THURSDAY, JUNE 5, 1941—AFTERNOON

The following officers were elected: chairman, Arthur W. Allen, Boston; vice chairman, William L. Estes Jr.; Bethlehem, Pa.; secretary, Alton Ochsner, New Orleans; delegate, Henry W. Cave, New York; alternate, Grover C. Penberthy, Detroit; representative on American Board of Surgery, Edward D. Churchill, Boston (to succeed Howard M. Clute, resigned); governor American College of Surgeons, Thomas E. Jones, Cleveland; members American Board of Plastic Surgery: V. P. Blair, St. Louis; William S. Kiskadden, Los Angeles, and Gustave Aufrecht, New York; executive committee; Dr. Thomas M. Joyce, Portland, Ore.; Lloyd Noland, Fairfield, Ala., and Arthur W. Allen, Boston.

Drs. H. Glenn Bell and Leon Goldman, San Francisco, presented a paper on "The Surgical Management of Gallbladder Disease as Correlated with Newer Physiologic Concepts." Discussed by Dr. Warren H. Cole, Chicago.

Drs. William H. Meade and Carroll H. Long, New Orleans, presented a paper on "The Use of Cotton as a Suture Material, with Particular Reference to Its Clinical Application." Discussed by Drs. Donald Guthrie, Sayre, Pa.; John M. Farris, Ann Arbor, Mich.; John E. Cannaday, Charleston, W. Va.; Alton Ochsner, New Orleans, and Carroll H. Long, New Orleans.

Drs. William E. Ladd and Robert R. White, Boston, presented a paper on "Embryoma of the Kidney (Wilms Tumor)." Discussed by Drs. James T. Priestley, Rochester, Minn.; Monroe Wolf, New Orleans, and William E. Ladd, Boston.

Dr. Lloyd Noland, Fairfield, Ala., read the chairman's address, entitled "Diagnosis, a Responsibility of the Surgeon."

Dr. Alfred Goldman, San Francisco, read a paper on "Cancer of the Lung of Long Duration." Discussed by Dr. Edward J. O'Brien, Detroit.

Drs. Geza de Takats and Howard E. Heyer, Chicago, presented a paper on "The Surgical Approach to Hypertension." Discussed by Drs. Reginald H. Smithwick, Boston; Claude S. Beck, Cleveland; Edgar Kahn, Ann Arbor, Mich., and Geza deTakats, Chicago.

Drs. Claude E. Welch and Henry H. Faxon, Boston, presented a paper on "Phlebitis and Pulmonary Embolism." Discussed by Drs. Alton Ochsner, New Orleans; Henry A. H. Faxon, Boston, and Conrad R. Lam, Detroit.

FRIDAY, JUNE 6—MORNING

A joint meeting was held with the Section on Orthopedic Surgery. The proceedings are reported in the minutes of that section.

## SECTION ON OBSTETRICS AND GYNECOLOGY

WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Norman F. Miller, Ann Arbor, Mich.

Drs. Samuel A. Cosgrove and James F. Norton, Jersey City, N. J., presented a paper on "Indications and Relative Merits of the Classic, Low and Extraperitoneal Cesarean Sections."

Dr. Frederick H. Falls, Chicago, read a paper on "Mortality, Early and Late, Following Cesarean Section."

These two papers were discussed by Drs. Louis E. Phaneuf, Boston; H. Hudnall Ware Jr., Richmond, Va.; Joseph B. DeLee, Chicago; James F. Norton, Jersey City, N. J., and Frederick H. Falls, Chicago.

Dr. Daniel G. Morton, San Francisco, read a paper on "Early Diagnosis and Proper Management in Cervical Cancer." Discussed by Drs. Ralph E. Campbell, Madison, Wis.; George Gray Ward, New York; John J. Gilbride, Philadelphia; Emil Novak, Baltimore; Charles E. Galloway, Evanston, Ill.; E. H. Kloman, Baltimore, and Daniel G. Morton, San Francisco.

Dr. Charles H. Peckham Jr., Cooperstown, N. Y., read a paper on "Certain Legal and Therapeutic Aspects of the Problem of Syphilis and Pregnancy." Discussed by Drs. Carl P. Huber, Indianapolis; Herman Beerman, Philadelphia, and Charles H. Peckham Jr., Cooperstown, N. Y.

Drs. Brooke M. Anspach and John B. Montgomery, Philadelphia, presented a paper on "The Simpson Operation and the Smith Pessary in the Treatment of Retroflexion of the Uterus in the Child-Bearing Woman." Discussed by Drs. Paul Titus, Pittsburgh; Arthur H. Bill, Cleveland; Willard R. Cooke, Galveston, Texas; William H. Weir, Cleveland; Channing W. Barrett, Chicago, and Brooke M. Anspach, Philadelphia.

THURSDAY, JUNE 5—MORNING

Dr. Samuel H. Geist, New York, read a paper on "Androgen Therapy in Gynecology."

Dr. E. C. Hamblen, Durham, N. C., read a paper on "Uses and Limitations of Estrogens in Gynecic Practice."

These two papers were discussed by Drs. Charles Mazer, Philadelphia; Ludwig A. Emge, San Francisco; Jean Paul Pratt, Detroit; James B. Hamilton, New Haven, Conn.; Karl John Karnaky, Houston, Texas; Udall J. Salmon, New York; Samuel H. Geist, New York, and E. C. Hamblen, Durham, N. C.

Dr. Rachelle Seletz, Los Angeles, read a paper on "Pruritus Ani and Vulvae: Diagnosis and Management." Discussed by Drs. E. W. Netherton, Cleveland; H. C. Hesseltine, Chicago; Karl John Karnaky, Houston, Texas; Goodrich C. Schauffler, Portland, Ore.; Samuel G. Slo-Bodkin, Brooklyn, and Rachelle Seletz, Los Angeles.

Dr. Irving F. Stein, Chicago, read a paper on "Deflexion Attitudes in Breech Presentation." Discussed by Drs. Harold Henderson, Detroit; Joseph B. DeLee, Chicago; Euclid T. Gaddy, Indianapolis, and Irving F. Stein, Chicago.

Drs. Paul F. Fletcher and Ora J. Gibson, St. Louis, presented a paper on "Sulfathiazole in the Treatment of Gonorrhea in Women." Discussed by Drs. William H. Vogt, St. Louis; William Bickers, Richmond, Va., and Paul F. Fletcher, St. Louis.

Dr. Norman F. Miller, Ann Arbor, Mich., read the chairman's address, entitled "The Perpetuation of Error in Obstetrics and Gynecology."

## FRIDAY, JUNE 6—MORNING

The following officers were elected: chairman, Dr. Walter Dannreuther, New York; vice chairman, Dr. LeRoy Adelbert Calkins, Kansas City, Mo.; secretary, Dr. Philip F. Williams, Philadelphia; delegate, Dr. Jean Paul Pratt, Detroit; alternate, Dr. Harvey B. Matthews, Brooklyn; representatives to American Committee on Maternal Welfare: Dr. Goodrich C. Schauffler, Portland, Ore.; Dr. Everett D. Plass, Iowa City, and Dr. Robert D. Mussey, Rochester, Minn.; representative to Scientific Exhibit, Dr. Charles E. Galloway, Evanston, Ill.

Drs. Robert D. Mussey and Arthur B. Hunt, Rochester, Minn., presented a paper on "The Toxemias of Pregnancy: Their Classification an Aid to Management of Parturition."

Dr. Roy E. Nicodemus, Danville, Pa., read a paper on "The Importance of Oxygen Tent Therapy as an Additional Measure in the Conservative Treatment of Eclampsia." Discussed by Drs. Thaddeus L. Montgomery, Philadelphia, and Roy E. Nicodemus, Danville, Pa.

Dr. Goodrich C. Schauffler, Portland, Ore., read a paper on "Pregnancy with Double Uterus and Vagina; Complications, Management and Prognosis." Discussed by Drs. Norman F. Miller, Ann Arbor, Mich., and Goodrich C. Schauffler, Portland, Ore.

Dr. Robert L. Dickinson, New York, read a paper on "The Premarital Medical Consultation." Discussed by Drs. Sophia J. Klegman, New York; Marie Pichel Warner, New York; Anna K. Daniels, New York; Robert W. Laidlaw, New York; William H. Weir, Cleveland, and Robert L. Dickinson, New York.

Drs. J. P. Greenhill and S. C. Freed, Chicago, presented a paper on "The Electrolyte Therapy of Premenstrual Distress." Discussed by Drs. Jacob Kotz, Washington, D. C.; Karl John Karnaky, Houston, Texas; Esther B. Tietz, Longview State Hospital, Cincinnati, and J. P. Greenhill, Chicago.

## SECTION ON OPHTHALMOLOGY

## WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Albert C. Snell, Rochester, N. Y.

Dr. Albert C. Snell, Rochester, N. Y., read the chairman's address, entitled "Some Principles of Medical Ethics and the Practice of Ophthalmology."

Dr. Arthur J. Bedell, Albany, N. Y., read a paper on "Traumatic Changes in the Retina, Choroid, Nervehead and Vitreous." Discussed by Drs. Parker Health, Detroit; Morris Davidson, New York; M. M. Cullom, Nashville, Tenn., and Arthur J. Bedell, Albany.

Dr. Albert L. Brown, Cincinnati, read a paper on "Lime Burns of the Eye. The Use of Rabbit Peritoneum to Prevent Severe Delayed Effects: Experimental Studies and Report of Cases." Discussed by Drs. Eugene L. Bulson, Fort Wayne, Ind.; Robert J. Masters, Indianapolis, and Albert L. Brown, Cincinnati.

Drs. Glen Gregory Gibson and Lawrence W. Smith, Philadelphia, presented a paper on "Retinal Phlebosclerosis." Discussed by Drs. Cecil S. O'Brien, Iowa City; Henry Patrick Wagener, Rochester, Minn., and Glen Gregory Gibson, Philadelphia.

Dr. Ferdinand L. P. Koch, New York, read a paper on "Retinal Arterial Diastolic Blood Pressure and the Caliber of the Retinal Arterioles in Systemic Vascular Hypertension: A Clinical Study." Discussed by Drs. Irving Puntenney, Chicago; James E. Lebensohn, Chicago, and Ferdinand L. P. Koch, New York.

Dr. Alfred Cowan, Philadelphia, read a paper on "Causes of Blindness in Pennsylvania: An Analysis of a Group of Over Thirty Thousand Blind Eyes." Discussed by Drs. C. W. Rutherford, Indianapolis; Harry S. Gradle, Chicago; Conrad Berens, New York, and Alfred Cowan, Philadelphia.

## THURSDAY, JUNE 5—AFTERNOON

Dr. Phillips Thygeson, New York, read a paper on "The Epidemiology of Inclusion Conjunctivitis." Discussed by Drs. Alton E. Braley, Detroit; L. A. Julianelle, St. Louis; James E. Lebensohn, Chicago, and Phillips Thygeson, New York.

Drs. Jack S. Guyton and Alan C. Woods, Baltimore, presented a paper on "Etiology of Uveitis: A Clinical Study of Five Hundred and Sixty-Two Cases." Discussed by Drs. Walter F. Duggan, Utica, N. Y.; John S. McGavic, New York; T. L. Terry, Boston, and Alan C. Woods, Baltimore.

Dr. Conrad Berens, New York, read a paper on "Ocular Conditions Associated with Coliform Bacteria: Certain Clinical and Experimental Considerations of Infections of the Upper Respiratory Tract with Coliform Bacteria." Discussed by Drs. Peter C. Kronfeld, Chicago; John A. Toomey, Cleveland, and Conrad Berens, New York.

Dr. David O. Harrington, San Francisco, read a paper on "Tonometric Standardization: A Contribution to the Accuracy of Tonometry Through a Method of Reducing Its Variables to Constants and Minimizing Its Errors Through Refinement and Standardization of the Tonometer." Discussed by Drs. Jonas S. Friedenwald, Baltimore; T. L. Terry, Boston, and David O. Harrington, San Francisco.

## Demonstration Session

Dr. David O. Harrington, San Francisco, gave a demonstration of the tonometer.

Dr. Samuel G. Higgins, Milwaukee, gave a lantern demonstration of the corneal scleral sutures.

## Executive Session

Dr. Derrick Vail, Cincinnati, brought up the optometry problem and the question of rebates. He called to the attention of the members that a number of years ago the section went on record that it was considered unethical for any of its members to accept rebates in any way, shape or form; that the executive committee endorses this stand and considers the problem closed so far as the section is concerned and hereby gives notice that any individual will have to stand on his own merit.

Dr. Walter B. Lancaster, Hanover, N. H., reported for the subcommittee of the Committee (Joint) on Optics and Visual Physiology on the optometry problem.

It was voted, on motion by A. R. Irvine, Los Angeles, as amended by Dr. Arthur J. Bedell, Albany, N. Y., that the section recommend to the House of Delegates that the following resolution, adopted by the House of Delegates in 1935, be rescinded:

WHEREAS, There have been many complaints regarding the action of some ophthalmologists in giving lectures to and consulting with opticians and optometrists; and

WHEREAS, It is universally conceded that to care for the diseases and conditions of the human eye demands the unusual knowledge of a graduate physician who has been especially prepared; and

WHEREAS, The eye is an integral part of the body; and

WHEREAS, No one but a physician so trained should be permitted to diagnose, treat or prescribe for eye conditions; and

WHEREAS, Lecture, address or any other form of instruction to opticians and optometrists by ophthalmologists is not only a breach of the principles of medical ethics, which control our professional relationships, but is also to the detriment of the ocular health of the public by giving it a false sense of security; and

WHEREAS, General health and ocular comfort depend on the best medical care; therefore, be it

Resolved, That the Section on Ophthalmology of the American Medical Association declares that it is unethical for any member of the American Medical Association to give lectures or courses of instruction or to consult with any one not associated with the actual medical service; and be it further

Resolved, That the House of Delegates of the American Medical Association be asked to make a ruling to this effect.

## FRIDAY, JUNE 6—AFTERNOON

## Executive Session

The Research Medal Award was presented to Dr. Walter B. Lancaster, Hanover, N. H.

Dr. Harry S. Gradle, Chicago, presented the report of the Committee on Visual Economics as printed in the program, and, on motion, it was voted that the delegate of the section to the House of Delegates present it to the next meeting of the House of Delegates for adoption.

Dr. Derrick Vail, Cincinnati, read the report of the Committee on Knapp Testimonial Fund. The report was accepted.

Dr. Walter B. Lancaster, Hanover, N. H., read the report of the American Committee on Optics and Visual Physiology, with the following recommendations:

1. Your committee recommends lowering the standard for visual acuity for admittance to West Point to 20/30 without correction in each eye, provided that 20/20 or better is obtained in each eye with lenses. The test must be conducted under standard conditions. Your committee recommends the Landolt broken ring and at least 20 foot candles of illumination.

2. The committee approves the licensing of dispensing opticians and recommends that, in every state in which difficulty is encountered in having the dispensing opticians licensed separately, a plan be adopted whereby the dispensing opticians would be licensed by the board of medical examiners.

The report and recommendations were approved.

Dr. Walter B. Lancaster, Hanover, N. H., reported that the Committee on Awarding the Knapp Medal voted to make no award this year.

Dr. S. Judd Beach, Portland, Maine, read the report of the American Board of Ophthalmology, which was accepted.

Dr. Derrick Vail, Cincinnati, read the report of the Committee on National Museum of Ophthalmic Pathology. The report was accepted.

Dr. Derrick Vail, Cincinnati, read the report of the Committee on Scientific Exhibit, which was accepted.

Dr. Arthur J. Bedell, Albany, N. Y., reported as delegate of the section to the House of Delegates.

Dr. Derrick Vail, Cincinnati, read the report of the Committee on Museum of Ophthalmic History, which was accepted.

Dr. George Guibor, Ottawa, Ill., read the report of the Committee on Orthoptics. The report was accepted.

Dr. Harry Gradle, Chicago, read the report of the Advisory Committee to the Eye Health Committee of the American Student Health Association. The report was accepted with the amendment deleting the words "and conditions of ocular health."

Dr. T. L. Terry, Boston, reported that the Ophthalmic Literature Committee wished to continue seeking the proper time and method of introducing comprehensive ophthalmic abstracts of the international literature and had no recommendations at present. The report was accepted.

Dr. S. Judd Beach, Portland, Maine, reported for the Committee on Conservation and Prevention of Blindness.

The following officers were elected: chairman, Dr. Lawrence T. Post, St. Louis; vice chairman, Dr. W. R. Buffington, New Orleans.

The following committee appointments were recommended by the executive committee and approved:

To fill vacancy on the Committee on American Board of Ophthalmology, the reelection of Dr. Daniel B. Kirby, New York, to serve for a term of four years.

The reelection of Dr. Walter B. Lancaster, Hanover, N. H., to the American Committee (Joint) on Optics and Visual Physiology, to serve for a term of three years.

The reelection of Dr. Jonas S. Friedenwald, Baltimore, to the Committee (Joint) on National Museum of Ophthalmic Pathology.

The reelection of Dr. Georgiana Dvorak Theobald, Oak Park, Ill., to fill the vacancy of chairman of the Committee for Scientific Exhibit from the Section. The appointment of Dr. Derrick Vail, Cincinnati, and Dr. W. Ivan Lillie, Philadelphia, to the committee.

The reelection of the present members to the Committee on Museum of Ophthalmic History.

The reelection of Dr. William L. Benedict, Rochester, Minn., to the Advisory Committee of Student Health Association.

The election of Dr. Frank D. Costenbader, Washington, D. C., to fill a vacancy of the Committee on American Orthoptic Council, to serve for three years.

The reappointment of the present members of the Committee on Ophthalmic Literature (Joint).

The formation of a Committee on Industrial Ophthalmology, to consist of the following members: Dr. Albert C. Snell, Rochester, N. Y., chairman; Dr. Hedwig S. Kuhn, Hammond, Ind., and Dr. Arthur M. Culler, Dayton, Ohio.

The election of Dr. Ralph O. Rychener, Memphis, Tenn., to fill a vacancy of the Committee on Visual Economics. The appointment of Dr. Alfred Cowan, Philadelphia, as chairman of the committee.

The election of Dr. William L. Benedict, Rochester, Minn., to the Council of the Pan American Congress representing the section.

The appointment of Dr. Thomas D. Allen, Chicago, to represent the section on the board of governors of the American College of Surgeons.

The following committee for awarding the Knapp Medal for 1941 was elected from the floor: Dr. Alfred Cowan, Philadelphia; Dr. Parker Heath, Detroit, and Dr. Clyde A. Clapp, Baltimore.

#### Scientific Session

Drs. Thomas D. Allen and Walter G. Ackerman, Chicago, presented a paper on "Hereditary Glaucoma in Three Generations of a Family." Discussed by Drs. Paul A. Chandler, Boston, and Thomas D. Allen, Chicago.

Dr. William Thornwall Davis, Washington, D. C., read a paper on "Superficial Punctate Parenchymatous Keratitis." Discussed by Drs. Sanford R. Gifford, Chicago; Trygve Gundersen, Boston, and William Thornwall Davis, Washington, D. C.

Dr. Loren Pritchard Guy, New York, read a paper on "Ocular Torticollis: Differential Diagnosis." Discussed by Drs. A. D. Ruedemann, Cleveland; Don Marshall, Kalamazoo, Mich.; Thomas D. Allen, Chicago; George Guibor, Ottawa, Ill., and Loren Pritchard Guy, New York.

Dr. James W. White, New York, read a paper on "Paralysis of the Superior Rectus and Inferior Oblique of the Same Eye." Discussed by Drs. John B. Hitz, Milwaukee; Walter B. Lancaster, Hanover, N. H.; Hermann M. Burian, Hanover, N. H., and James W. White, New York.

Dr. Hermann M. Burian, Hanover, N. H., read a paper on "Fusional Movements in Permanent Strabismus: A Study of the Role of the Central and Peripheral Retinal Regions in the Act of Binocular Vision in Squint." Discussed by Drs. Walter Henry Fink, Minneapolis, and Joseph I. Pascal, New York.

### SECTION ON LARYNGOLOGY, OTOTOLOGY AND RHINOLOGY

WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. LeRoy A. Schall, Boston.

Dr. Paul H. Holinger, Chicago, read a paper on "The Influence of Expectorants and Gases on Sputum and the Mucous Membranes of the Tracheobronchial Tree." Discussed by Dr. Henry G. Poncher, Chicago.

Dr. Ernest M. Seydell, Wichita, Kan., read a paper on "The Relation of Tonsillectomy to Poliomyelitis." Discussed by Drs. Harris P. Mosher, Marblehead, Mass., and T. E. Carmody, Denver.

Dr. W. E. Grove, Milwaukee, read a paper on "Problems of the Hard of Hearing in Industry." Discussed by Drs. Horace Newhart, Minneapolis, and C. H. McCaskey, Indianapolis.

Dr. Henry M. Goodyear, Cincinnati, read a paper on "The Use of Iodized Oil in the Treatment of Nasal Antrum Infections." Discussed by Drs. Arthur W. Proetz, St. Louis; O. E. Van Alyea, Chicago; Paul M. Moore Jr., Cleveland; Theodore E. Walsh, St. Louis; Frank R. Spencer, Boulder, Colo., and Henry M. Goodyear, Cincinnati.

#### Executive Session

On motion by Dr. Frank R. Spencer, Boulder, Colo., seconded by Dr. Arthur W. Proetz, St. Louis, the application of Dr. Avery S. Krashen, D.D.S., of 8 South Michigan Avenue, Chicago, for associate membership in the section was approved.

## THURSDAY, JUNE 5—MORNING

Dr. LeRoy A. Schall, Boston, read the chairman's address, entitled "The Treatment of Staphylococcic Cavernous Sinus Thrombophlebitis."

Dr. William D. Province, New York, read a paper on "Principles of Chemotherapy." Discussed by Drs. George E. Shambaugh Jr., Chicago; Edward D. King, Cincinnati; Frank R. Spencer, Boulder, Colo.; Robert H. Fraser, Battle Creek, Mich., and William D. Province, New York.

Dr. M. M. Cullom, Nashville, Tenn., read a paper on "Ozena." Discussed by Drs. Joseph C. Beck, Chicago; J. Milton Robb, Detroit; Fletcher D. Woodward, Charlottesville, Va.; William S. Van Fossen, Columbus, Ohio; Gerald M. Koepcke, Minneapolis, and M. M. Cullom, Nashville, Tenn.

Dr. French K. Hansel, St. Louis, read a paper on "Atypical Nasal Allergy."

Drs. Fletcher D. Woodward and Oscar Swineford Jr., Charlottesville, Va., read a paper on "The Relationship of Otolaryngology to Allergy."

These two papers were discussed by Drs. Grafton Tyler Brown, Washington, D. C.; J. Alexander Clarke Jr., Philadelphia; George Piness, Los Angeles; French K. Hansel, St. Louis, and Oscar Swineford Jr., Charlottesville, Va.

Drs. F. E. LeJeune and P. J. Bayon, New Orleans, presented a paper on "Acute Laryngotracheobronchitis." Discussed by Drs. Henry B. Orton, Newark, N. J.; Louis H. Clerf, Philadelphia; Frank R. Spencer, Boulder, Colo., and F. E. LeJeune, New Orleans.

## FRIDAY, JUNE 6—MORNING

*Executive Session*

The following officers were elected: chairman, Dr. Gordon F. Harkness, Davenport, Iowa; vice chairman, Dr. Daniel S. Cuning, New York; secretary, Dr. Louis H. Clerf, Philadelphia; executive committee: Dr. Arthur W. Proetz, St. Louis; Dr. LeRoy A. Schall, Boston, and Dr. Gordon Harkness, Davenport, Iowa; delegate, Dr. Burt R. Shurly, Detroit; alternate, Dr. Gordon F. Harkness, Davenport, Iowa.

Dr. John J. Shea, Memphis, Tenn., and Dr. Joseph C. Beck, Chicago, reported for the Board of Otolaryngology that 3,181 men had been certified by the board to date, and that two examinations had been held this year, both in Cleveland, 84 being certified at the examination last week.

Dr. Chevalier L. Jackson, Philadelphia, chairman of the Committee on Lye Legislation, reported that the committee still was active and that a formal report would be presented next year.

*Scientific Session*

Dr. A. C. Furstenberg, Ann Arbor, Mich., read a paper on "Diseases of the Salivary Glands." Discussed by Drs. Walter B. Hoover, Boston; Gordon B. New, Rochester, Minn., and A. C. Furstenberg, Ann Arbor, Mich.

Dr. Louis Hubert, New York, read a paper on "Thrombosis of the Lateral Sinus: An Analysis of Results Obtained in One Hundred and Nineteen Cases." Discussed by Drs. George M. Coates, Philadelphia; Fred W. Dixon, Cleveland, and Louis Hubert, New York.

Drs. Ralph Adams and Lowry F. Davenport, Boston, presented a paper on "The Technic of Bronchography and a System of Bronchial Nomenclature." Discussed by Drs. Chevalier L. Jackson, Philadelphia; Louis H. Clerf, Philadelphia, and Ralph Adams, Boston.

Dr. Theodore E. Walsh, St. Louis, read a paper on "Prophylaxis of the Common Cold." Discussed by Drs. John J. Shea, Memphis, Tenn.; Walter B. Hoover, Boston; Sylvester C. Missal, Cleveland, and Theodore E. Walsh, St. Louis.

Dr. George D. Wolf, New York, read a paper on "Rhino-plasty and Its Relation to Rhinology." Discussed by Drs. Samuel Salinger, Chicago; Vilray P. Blair, St. Louis; Myron F. Metzenbaum, Cleveland, and George D. Wolf, New York.

## SECTION ON PEDIATRICS

## WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2:05 by the chairman, Dr. Julius H. Hess, Chicago.

Dr. John Dorsey Craig, New York, read a paper on "Prognosis of Acute Hemorrhagic Nephritis in Children." Discussed by Dr. Jerome L. Kohn, New York.

Dr. Bernard Gumbiner, Chicago, read a paper on "Spontaneous Pneumomediastinum of the Newborn Infant." Discussed by Dr. C. C. Macklin, London, Ont.

Dr. H. Jerry Lavender, Cincinnati, read a paper on "Burns in Children: Analysis of Two Hundred and Fifty Cases." Discussed by Drs. R. H. Aldrich, Boston; Adalbert G. Bettman, Portland, Ore., and H. Jerry Lavender, Cincinnati.

Drs. J. M. Lewis, Oscar Bodansky and Charles Haig, New York, presented a paper on "Evaluation of Vitamin A Blood Level as an Indicator of Vitamin A Deficiency in Infants and in Children." Discussed by Drs. Arthur F. Abt, Chicago, and J. M. Lewis, New York.

Dr. Oscar Reiss, Los Angeles, chairman of the resolutions committee, presented a resolution expressing the appreciation of the section to the officers of the Association for their efforts in the recent trial of the American Medical Association in a District of Columbia court.

Dr. Alexander T. Martin, New York, read a paper on "Twenty Years' Observation on 1,438 Children with Rheumatic Heart Disease." Discussed by Drs. William D. Stroud, Philadelphia; A. L. Van Horn, Washington, D. C.; George J. Feldstein, Pittsburgh; T. Duckett Jones, Boston, and Joseph T. Roberts, Galveston, Texas.

Drs. L. M. Tocantins, James F. O'Neill and Harold W. Jones, Philadelphia, presented a paper on "The Intramedullary Route for the Parenteral Administration of Blood and Other Fluids."

Drs. George B. Logan and Edward J. Baldes, Rochester, Minn., presented a paper on "Parallel Clinical and Electroencephalographic Improvement in Epilepsy: A Study of Children Treated by the Ketogenic Diet."

## THURSDAY, JUNE 5—AFTERNOON

The following officers were elected: chairman, Dr. Phillip M. Stimson, New York; vice chairman, Dr. Oscar Reiss, Los Angeles; secretary, Dr. Hugh L. Dwyer, Kansas City, Mo.; delegate, Dr. William Weston, Columbia, S. C.; alternate, Dr. Julius H. Hess, Chicago (to fill the unexpired term of Dr. A. Graeme Mitchell, deceased); executive committee: Dr. William Weston, Columbia, S. C. (to serve the unexpired term of Dr. Edward Clay Mitchell, Memphis, Tenn., during the 1941 session, who was absent on account of illness); representative in charge of the scientific exhibit, Dr. Arthur F. Abt, Chicago; secretary-treasurer of the Abraham Jacobi Fund, Dr. Hugh L. Dwyer, Kansas City, Mo.

The secretary-treasurer of the Abraham Jacobi Fund read his report.

A communication was read from the American Board of Pediatrics relative to the examination of candidates for certification to this board.

Dr. Julius H. Hess, Chicago, read the chairman's address, entitled "The Pediatrician: His Obligation to the State in Peace and War."

The following papers were read in a Panel Discussion on "Endocrine Disorders of Adolescence":

Dr. E. Kost Shelton, Los Angeles: "Preadolescent Hypothyroidism."

Dr. Roger L. J. Kennedy, Rochester, Minn.: "Hyperthyroidism in Childhood."

Dr. A. Wilmot Jacobsen, Buffalo: "Endocrine Factors Influencing Growth."

Dr. Emil Novak, Baltimore: "Gynecologic Problems of Adolescence."

Dr. Ralph H. Kunstadter, Chicago: "Adiposogenital Dys-trophies."

Dr. Willard O. Thompson, Chicago: "Endocrine Treatment of Cryptorchism."

Dr. Richard L. Sutton Jr., Kansas City, Mo.: "Acne of Adolescence."

These seven papers were discussed by Drs. Theodore O. Elterich, Pittsburgh, and E. Perry McCullagh, Cleveland.

Following the presentation of these papers and formal discussion, questions were submitted by the members of the section and answered by the particular member of the panel to whom they were directed.

#### FRIDAY, JUNE 6—AFTERNOON

A joint meeting was held with the Section on Preventive and Industrial Medicine and Public Health. The proceedings are reported in the minutes of that section.

### SECTION ON PHARMACOLOGY AND THERAPEUTICS

#### WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2:05 by the chairman, Dr. C. M. Gruber, Philadelphia.

Dr. David Ayman, Boston, read a paper on "Blood Pressure Determinations of Patients with Hypertension."

Drs. M. Herbert Barker and Howard A. Lindberg, Chicago, and Maurice H. Wald, Winnetka, Ill., presented a paper on "Treatment of Hypertension with Potassium Thiocyanate."

These two papers were discussed by Drs. John R. Williams, Winston-Salem, N. C., and David Ayman, Boston.

Dr. Julian M. Ruffin, Durham, N. C., read a paper on "Diagnosis and Treatment of Mild Vitamin Deficiencies."

Dr. Norman H. Jolliffe, New York, read a paper on "Treatment of Neurologic Disorders with Vitamins."

These two papers were discussed by Drs. F. P. Moersch, Rochester, Minn.; I. S. Wechsler, New York; C. A. Mills, Cincinnati; Meyer A. Zeligs, Cincinnati; Leon Schiff, Cincinnati; Thomas T. Mackie, New York, and Norman H. Jolliffe, New York.

Dr. Edward F. Hartung, New York, read a paper on "Treatment of Rheumatoid Arthritis with Gold Salts: Possible Mode of Action." Discussed by Drs. Charles H. Slocumb, Rochester, Minn.; Russell L. Cecil, New York; Richard H. Freyberg, Ann Arbor, Mich.; H. M. Margolis, Pittsburgh; C. M. Gruber, Philadelphia, and Edward F. Hartung, New York.

Drs. Francis D. Murphy and Bruno J. Pietraszewski, Milwaukee, presented a paper on "Acute Nephritis, with Special Reference to the Recognition and Treatment of the Early Phases and the Outcome Ten Years Later in Eighty-Nine Cases." Discussed by Drs. N. M. Keith, Rochester, Minn., and Moses Barron, Minneapolis.

Drs. W. H. Feldman and H. C. Hinshaw, Rochester, Minn., presented a paper on "Therapeutic Effect of Sodium P, P'-Diamino-Diphenyl-Sulfone-N-N'-Didextrose Sulfonate (Promin) in Experimental Tuberculosis." Discussed by Dr. J. Arthur Myers, Minneapolis.

#### THURSDAY, JUNE 5—AFTERNOON

The following officers were elected: chairman, Dr. Wallace M. Yater, Washington, D. C.; vice chairman, Dr. Tinsley R. Harrison, Winston-Salem, N. C.; secretary, Dr. Edgar V. Allen, Rochester, Minn.; delegate, Dr. O. P. J. Falk, St. Louis; alternate, Dr. George R. Herrmann, Galveston, Texas; in charge of exhibits, Dr. Dwight L. Wilbur, San Francisco; executive committee: Drs. Irving S. Wright, New York; C. M. Gruber, Philadelphia, and Wallace M. Yater, Washington, D. C.

The chairman read a report from Dr. O. P. J. Falk, St. Louis, delegate of the section to the House of Delegates, announcing the amendment of the By-Laws of the American Medical Association, changing the name of the Section on Pharmacology and Therapeutics to the Section on Experimental Medicine and Therapeutics.

Dr. C. M. Gruber, Philadelphia, read the chairman's address, entitled "Some Differences in Actions of the Barbiturates and Thiobarbiturates When Administered to Man and Experimental Animals."

Drs. N. M. Keith, A. E. Osterberg and H. B. Burchell, Rochester, Minn., presented a paper on "Some Effects of Potassium Salts in Man." Discussed by Drs. M. Herbert Barker, Chicago; J. M. Hayman, Cleveland, and N. M. Keith, Rochester, Minn.

Dr. Edwin E. Osgood, Portland, Ore., read a paper on "Neosarsphenamine in the Therapy of Bacterial Infections." Discussed by Drs. Louis N. Katz, Chicago, and Edwin E. Osgood, Portland, Ore.

Drs. Adolph Sachs, Victor E. Levine and Agnes Schmit, Omaha, presented a paper on "Copper and Iron in Human Blood."

Dr. Ernest H. Falconer, San Francisco, read a paper on "Treatment of Polycythemia Vera with Lead Compounds."

These two papers were discussed by Drs. Carl V. Moore, St. Louis; Howard L. Alt, Chicago; William Damschek, Boston; Adolph Sachs, Omaha, and Ernest H. Falconer, San Francisco.

Drs. James A. Greene and L. W. Swanson, Iowa City, presented a paper on "The Utilization and Effect of Added Dextrose in Cases of Controlled and Uncontrolled Diabetes." Discussed by Drs. H. O. Mosenthal, New York, and David Adlersberg, New York.

Drs. Udall J. Salmon and Robert I. Walter, New York, presented a paper on "Treatment of the Menopause: Evaluation of Estrogen Implantation."

#### FRIDAY, JUNE 6—MORNING

A joint meeting was held with the Section on Practice of Medicine. The proceedings are reported in the minutes of that section.

### SECTION ON PATHOLOGY AND PHYSIOLOGY

#### WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9:15 by the chairman, Dr. Carl J. Wiggers, Cleveland.

Dr. Carl J. Wiggers, Cleveland, read the chairman's address, entitled "The Applicability of Experimental Results to the Shock Problem in Man."

The following papers were read as a symposium on "physiology":

Dr. William H. Howell, Baltimore: "Recent Advances in the Problem of Blood Coagulation Applicable to Medicine."

Dr. Andrew C. Ivy, Chicago: "The Applied Physiology of Bile Secretion and Bile Salt Therapy."

Dr. Frank C. Mann, Rochester, Minn.: "The Liver and Medical Progress."

Dr. Frank A. Hartman, Columbus, Ohio: "The Adrenal Hormones in Medical Practice."

Dr. John F. Fulton, New Haven, Conn.: "Cerebral Function in Aviation."

Dr. Hallowell Davis, Boston: "Contributions of Physiology to Medicine: Electroencephalography."

#### THURSDAY, JUNE 5—MORNING

Dr. Howard W. Jones, Baltimore, read a paper on "Further Studies on Mesonephroma of the Ovary." Discussed by Drs. Walter Schiller, Chicago; Emil Novak, Baltimore, and Howard T. Karsner, Cleveland.

Drs. Frank R. Menne and Melvin W. Anderson, Portland, Ore., presented a paper on "Bronchiogenic Carcinoma: Its Incidence in the Pacific Northwest Together with a Commentary on Eighty-Four Instances." Discussed by Drs. Howard T. Karsner, Cleveland; Bela Halpert, New Orleans; L. Wallace Frank, Louisville, Ky.; Israel Davidsohn, Chicago, and Frank R. Menne, Portland, Ore.



Dr. J. Shelton Horsley, Richmond, Va., read a paper on "Carcinoma of the Jejunum and Ileum." Discussed by Dr. Fred W. Rankin, Lexington, Ky.

Drs. Newton G. Evans and Albert F. Brown, Los Angeles, presented a paper on "Carcinoma of the Prostate: Relation Between Histopathology and Clinical Course." Discussed by Drs. Israel Davidsohn, Chicago; Walter Schiller, Chicago; Roger W. Barnes, Los Angeles, and Newton G. Evans, Los Angeles.

Dr. Robert B. Greenblatt, Augusta, Ga., read a paper on "Histologic Changes in the Ovary Following Administration of Gonadotropin." Discussed by Drs. Frank W. Konzelmann, Philadelphia; Walter Schiller, Chicago; Udall J. Salmon, New York; Emil Novak, Baltimore, and Robert B. Greenblatt, Augusta, Ga.

A nominating committee was appointed, consisting of Drs. Frank W. Konzelmann, Philadelphia; John Paul Quigley, Ph.D., Cleveland, and Benjamin T. Terry, Tacoma, Wash.

#### FRIDAY, JUNE 6—MORNING

The following officers were elected: chairman, J. P. Simonds, Chicago; vice chairman, Frank C. Mann, Rochester, Minn.; secretary, J. J. Moore, Chicago; delegate, L. W. Larson, Bismarck, N. D.; alternate, J. J. Moore, Chicago; executive committee: Drs. Frank W. Hartman, Detroit; Carl J. Wiggers, Cleveland, and J. P. Simonds, Chicago.

Dr. L. W. Larson, Bismarck, N. D., delegate of the section to the House of Delegates, submitted his report dealing principally with the professional standing of pathologists in hospitals. On motion by Dr. Larson, the chairman of the section was authorized, by unanimous vote, to appoint a committee on industrial health to cooperate with the Council on Industrial Health.

Dr. J. M. Hill, Dallas, Texas, read a paper on "The Advantages and Clinical Uses of Desiccated Plasma Prepared by the Adtevae Process." Discussed by Drs. Harold W. Jones, Philadelphia; Carl J. Wiggers, Cleveland; J. Shelton Horsley, Richmond, Va.; Frank W. Konzelmann, Philadelphia, and J. M. Hill, Dallas, Texas.

Drs. M. Laurence Montgomery, San Francisco, and I. L. Chaikoff, Berkeley, Calif., presented a paper on "The Role of the External Secretion of the Pancreas in the Prevention of Fatty Infiltration of the Liver." Discussed by Drs. Lester R. Dragstedt, Chicago, and M. Laurence Montgomery, San Francisco.

Drs. M. A. Spellberg and Robert W. Keeton, Chicago, presented a paper on "Dietary Production of Fatty and Cirrhotic Livers, with a Study of the Specific Factor Involved." Discussed by Drs. Thomas E. Machella, Philadelphia; M. Laurence Montgomery, San Francisco; Virgil H. Moon, Philadelphia; J. P. Simonds, Chicago, and M. A. Spellberg, Chicago.

Drs. Henry N. Harkins, Detroit; C. Frank Chunn, Vicksburg, Miss., and Robert T. Boals, Detroit, presented a paper on "Alimentary Azotemia and the Bleeding Peptic Ulcer Syndrome." Discussed by Drs. D. H. Kaump, Detroit; Leon Schiff, Cincinnati; Walter L. Palmer, Chicago; Reuben Friedman, Philadelphia, and Henry N. Harkins, Detroit.

Drs. William Dameshek and Edward B. Miller, Boston, presented a paper on "The Pathogenesis of Hemolytic Anemia." Discussed by Drs. Russell L. Haden, Cleveland, and William Dameshek, Boston.

Drs. H. J. Corper and Maurice L. Cohn, Denver, presented a paper on "A Concrete Classic Demonstration of Two Separate Specific Immune Phenomena in Tuberculosis."

Drs. G. E. Wakerlin and C. A. Johnson, Chicago, presented a paper on "Reductions in Blood Pressures of Renal Hypertensive Dogs by Hog Renin." Discussed by Drs. Harry Goldblatt, Cleveland; Louis N. Katz, Chicago; John R. Williams, Winston-Salem, N. C., and G. E. Wakerlin, Chicago.

Drs. Charles F. Geschickter, Baltimore, and Elizabeth W. Byrnes, East Orange, N. J., presented a paper on "Factors Influencing Estrogenic Mammary Cancer in the Rat in Response to Estrogen."

## SECTION ON NERVOUS AND MENTAL DISEASES

#### WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 9 o'clock by the chairman, Dr. Tom B. Throckmorton, Des Moines, Iowa.

Drs. Leo Alexander, Merrill Moore and Abraham Myerson, Boston, presented a paper on "Alcohol and the Food, Drug and Cosmetic Act: A Proposal for Changes in Present Methods of Sale of Alcoholic Beverages to Conform with the Federal Food, Drug and Cosmetic Act." Discussed by Drs. Philip E. Piker, Cincinnati; Lawrence Kolb, Washington, D. C.; Theodore G. Klumpp, Washington, D. C., and Merrill Moore, Boston.

Dr. F. Garm Norbury, Jacksonville, Ill., read a paper on "Some Mental Mechanisms in Alcoholism." Discussed by Drs. Lloyd H. Ziegler, Wauwatosa, Wis.; G. Wilse Robinson Jr., Kansas City, Mo.; Theodore Diller, Pittsburgh; Robert V. Seliger, Baltimore, and F. Garm Norbury.

Dr. Tom B. Throckmorton, Des Moines, Iowa, read the chairman's address, entitled "Francis X. Dercum."

Drs. S. Bernard Wortis and Lewis I. Sharp, New York, presented a paper on "Fractures of the Spine with Spinal Cord Injury." Discussed by Drs. F. C. Grant, Philadelphia; Lewis J. Pollock, Chicago; Emil Seletez, Los Angeles, and S. Bernard Wortis, New York.

Drs. Maurice H. Greenhill, Durham, N. C., and Jacob E. Finesinger, Boston, presented a paper on "An Evaluation of Emotional Factors in Neurodermatitis." Discussed by Drs. Samuel W. Becker, Chicago; Marion B. Sulzberger, New York, and Maurice H. Greenhill, Durham, N. C.

Dr. C. Hunter Shelden, Pasadena, Calif., read a paper on "Neuromuscular Disorders: Results of Vitamin E Therapy."

Dr. Russell N. DeJong, Ann Arbor, Mich., read a paper on "Vitamin E and Alpha-Tocopherol Therapy in Neuromuscular and Muscular Disorders."

These two papers were discussed by Drs. F. P. Moersch, Rochester, Minn.; I. S. Wechsler, New York; S. Bernard Wortis, New York; Henry R. Viets, Boston; C. Hunter Shelden, Pasadena, Calif., and Russell N. DeJong, Ann Arbor, Mich.

#### THURSDAY, JUNE 5—AFTERNOON

Panel discussion on "Neurosurgical Treatment of Certain Abnormal Mental States" was participated in by Drs. Paul C. Bucy, Chicago, moderator; Walter Freeman, Washington, D. C.; M. A. Tarumian, Farnhurst, Del.; Theodore Charles Erickson, Montreal; J. G. Lyerly, Jacksonville, Fla.; H. D. Palmer, Philadelphia, and Roy R. Grinker, Chicago.

#### FRIDAY, JUNE 6—AFTERNOON

The following officers were elected: chairman, Stanley Cobb, Boston; vice chairman, A. R. Vonderahe, Cincinnati; secretary, Johannes M. Nielsen, Los Angeles; executive committee: Paul C. Bucy, Chicago; Tom B. Throckmorton, Des Moines, Iowa, and Stanley Cobb, Boston; delegate, Henry R. Viets, Boston; alternate, R. P. Mackay, Chicago; representative to American Board of Psychiatry and Neurology, Walter Freeman, Washington, D. C.; representative to Scientific Exhibit, F. P. Moersch, Rochester, Minn.

Dr. Walter Freeman, Washington, D. C., gave a report from the American Board of Psychiatry and Neurology, reporting one thousand, one hundred and forty diplomates. The report was received and placed on file.

The report of Dr. Paul C. Bucy, Chicago, as representative of the section on the American Board of Neurological Surgery was read by Johannes M. Nielsen, Los Angeles, and placed on file.

Dr. F. P. Moersch, Rochester, Minn., gave his report as representative of the section on the Council on Scientific Exhibits.

The report of Dr. Henry R. Viets, Boston, delegate, was read by Dr. Johannes M. Nielsen, Los Angeles, and was placed on file.

The section adopted the following resolution:

WHEREAS, The Council on Industrial Health of the American Medical Association has recently developed close working relationship with some of the sections in the Scientific Assembly; and

WHEREAS, The advantages arising out of such association have already become apparent; and

WHEREAS, Problems relating to industrial practice are arising in the field of neurology and psychiatry; therefore be it

Resolved, That the Section on Nervous and Mental Diseases endorses the work of the Council on Industrial Health and hereby extends aid to it by creating a committee whose representative or representatives, appointed by the chairman of this section for a term of one year, shall work with said Council in an endeavor to solve the problems of industrial medicine arising within the province of neurology and psychiatry.

Dr. Irving J. Sands, Brooklyn, read a paper on "The Diagnosis and Management of Subarachnoid Hemorrhage." Discussed by Drs. Siegfried Baumoc, Cleveland, and Irving J. Sands, Brooklyn.

Dr. Howard D. Fabing, Cincinnati, read a paper on "Induction of Metrazol Convulsions Under Nitrous Oxide Anesthesia." Discussed by Drs. Philip E. Piker, Cincinnati; A. E. Bennett, Omaha; Harold E. Himwich, Albany, N. Y., and Howard D. Fabing, Cincinnati.

Dr. Erich Liebert, Elgin, Ill., read a paper on "Spontaneous Convulsions Following Metrazol Treatment." Discussed by Drs. Roy R. Grinker, Chicago, and Erich Liebert, Elgin, Ill.

Dr. David John Impastato, New York, read a paper on "Electrically Induced Convulsions in the Treatment of Functional Disorders." Discussed by Drs. Walter Freeman, Washington, D. C.; J. L. Fetterman, Cleveland; Eugene Ziskind, Los Angeles; Irving J. Sands, Brooklyn, and David John Impastato, New York.

Dr. Frederic A. Gibbs, Boston, read a paper on "Diagnostic and Prognostic Value of the Electroencephalogram." Discussed by Drs. Edward J. Baldes, Rochester, Minn.; M. M. Miller, Cleveland, and Frederic A. Gibbs, Boston.

Dr. Irving Simons, New York, read a paper on "Microcystometry and Sphincterometry in the Study and Treatment of Neurologic Diseases." Discussed by Drs. E. L. Brodie, Buffalo, and Irving Simons, New York.

## SECTION ON DERMATOLOGY AND SYPHILOLOGY

WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2:10 by the chairman, Dr. J. Gardner Hopkins, New York.

Dr. Edward A. Oliver, Chicago, read the following resolution, to be laid before the Committee on Medical Preparedness of the American Medical Association:

Resolved, 1. That separate services for the specialties recognized by the American Medical Association and by the National Boards for the Medical Specialties should be organized and maintained in the Medical Corps in the Army and Navy. 2. That in all military and naval hospitals of sufficient size and permanence to warrant special departments, adequate physical facilities, equipment and personnel be made available for the proper practice of each specialty indicated. 3. That the chief of each special department should, if possible, be a medical officer holding a certificate from the appropriate national board in the specialty. 4. That the national boards for the various specialties be asked to study the facilities to be made available in military and naval hospitals, with the view of giving credit to junior medical officers for the time spent in these departments.

On motion by Dr. Howard Morrow, San Francisco, seconded by Dr. Joseph V. Klauder, Philadelphia, the resolution was adopted.

On motion by Dr. Harry M. Robinson, Baltimore, duly seconded and carried, it was voted to grant the privilege of the floor to Dr. Robert Brandt, formerly of Vienna and now of Cincinnati.

Dr. J. Gardner Hopkins, New York, read the chairman's address, entitled "The Education of a Dermatologist."

Drs. John H. Lamb and William E. Eastland, Oklahoma City, presented a paper on "Cancer of the Lower Lip: Treatment by Radiation." Discussed by Drs. James R. Driver, Cleveland; John W. Spellman, Brookline, Mass.; H. J. Templeton, Oakland, Calif., and John H. Lamb, Oklahoma City.

Drs. A. Benson Cannon and Marie B. Karelitz-Karry, New York, presented a paper on "Poikiloderma-like Changes in the Skin Following Arsenamine Dermatitis: Report of Two Cases." Discussed by Drs. Clyde L. Cummer, Cleveland; John

E. Rauschkolb, Cleveland; Maurice Oppenheim, Chicago, and A. Benson Cannon, New York.

Drs. Francis A. Ellis, Baltimore, and Hayden Kirby-Smith, Washington, D. C., presented a paper on "A Comparative Study of Necrobiosis Lipoidica and Granuloma Annulare." Discussed by Drs. Fred D. Weidman, Philadelphia; Hamilton Montgomery, Rochester, Minn.; F. J. Eichenlaub, Washington, D. C., and Francis A. Ellis, Baltimore.

Drs. Harry M. Robinson and Harry M. Robinson Jr., Baltimore, presented a paper on "Comparison of Frei Antigens." Discussed by Drs. Herman Beerman, Philadelphia; Robert Brandt, Cincinnati; Morris J. Strauss, New Haven, Conn.; Arthur W. Grace, New York, and Harry M. Robinson, Baltimore.

Drs. Francis W. Lynch, St. Paul, and Ruth E. Boynton and Anne C. Kimball, Minneapolis, presented a paper on "False Positive Serologic Reactions for Syphilis Due to Smallpox Vaccination." Discussed by Drs. Francis E. Seneor, Chicago; Benjamin S. Kline, Cleveland; Adolph B. Loveman, Louisville, Ky.; Charles R. Rein, New York; Arthur G. Schoch, Dallas, Texas, and Francis W. Lynch, St. Paul.

Drs. Frances M. Keddic, R. B. Rees Jr. and Norman N. Epstein, San Francisco, presented a paper on "Herpes Simplex Following Artificial Fever Therapy: Smallpox Vaccination as a Factor in Its Prevention." Discussed by Drs. Arthur G. Schoch, Dallas, Texas; Marion B. Sulzberger, New York; Roy Kile, Cincinnati; Everett Seale, Houston, Texas, and Norman N. Epstein, San Francisco.

THURSDAY, JUNE 5—AFTERNOON

Dr. Hamilton Montgomery, Rochester, Minn., representative to the Scientific Exhibit from the Section on Dermatology and Syphilology, presented the report of the committee as follows:

It was decided to continue with the joint motion picture exhibit. Owing to the necessity of combining motion picture exhibits with those of other sections, the exhibit of Dr. John H. Lamb, Oklahoma City, on Treatment of Cancer of the Lower Lip by Interstitial Radiation was separated from the dermatologic exhibit and put with other movies on cancer. I regret that it was necessary to turn down several applications for exhibits this year. Space for exhibits was a third less than that available at the New York meeting.

I wish to express my appreciation for the cooperation of the exhibitors in the section and joint motion picture exhibit and also to Dr. Thomas G. Hull for his usual splendid cooperation.

Our bank account, because of the usual donation from the American Medical Association of \$25 a year for expenses and as the result of decrease in correspondence and expenses regarding editing of motion picture films, is \$88.73 as compared to \$84.53 last year.

Dr. John G. Downing, Boston, presented the report of the Committee on Occupational Dermatoses as follows:

The Committee on Industrial Dermatoses has held three meetings since the last American Medical Association meeting.

The first meeting was held in Chicago in December at the time of the academy meeting, with Dr. S. J. Seegeer, the chairman, and Dr. Carl M. Peterson, the secretary of the Council on Industrial Health. Suggestions for cooperation with the Council were discussed. The definition of an occupational dermatosis worked out by the committee was reviewed. It was agreed that a plan should be developed for recording with the Council reports of unusual cases or groups of cases of industrial dermatoses. Such cases will be reviewed by a subcommittee of this committee, and acceptable cases will be filed with the Council acting as a permanent depository for such information. The teaching of occupational dermatoses in medical schools, consultants in industrial dermatoses, primary skin irritants and other subjects were also discussed. A Subcommittee on Primary Skin Irritants was appointed. This meeting was so successful from the Council's point of view that this setup will be used as a model for cooperation with other sections of the American Medical Association in the field of industrial medicine.

It is worth while pointing out at this time that the Council has outlined the activities of these section committees as follows:

1. To promote greater utilization of the services of established specialties in industry.

2. To clarify the relationships in industry between the clinical specialist and the employer, employee and physician in industry.
3. To develop a central clearing house of information covering industrial health problems encountered by clinical specialists.
4. To consider and publicize proper terminology.
5. To emphasize the necessity of incorporating pertinent industrial material in training and certification for specialty practice.
6. To review periodically significant developments in workmen's compensation and medicoinurance relationships.
7. To improve in all other necessary ways general standards of medical accomplishment in industry and in workmen's compensation procedure.

Two issues of an Industrial Dermatoses Bulletin have already appeared. These bulletins provide for the discussion of questions in this field among members of the committee and the Council. Results of these discussions will appear at intervals in *THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

In April, at the American Dermatological Association meeting in New Orleans, another meeting was held. The report of the Subcommittee on Primary Skin Irritants was presented, including a definition of a primary irritant. Much progress was made on the formulation of criteria for the diagnosis of industrial dermatoses. It was decided to send out a questionnaire on undergraduate and graduate teaching in industrial dermatology in the various medical schools. There was also discussion of the technic of handling case reports, medical testimony, the referring of questions on industrial dermatoses, and so on.

At the meeting of the committee on Wednesday morning, June 4, 1941, there was further discussion of the questionnaire on undergraduate teaching, and another draft of the criteria for the diagnosis of industrial dermatoses was considered. An interesting report of the Committee on Workmen's Compensation of the Society for the Study of Asthma and Allied Conditions was also discussed.

The Council on Industrial Health desires that there be a member of the committee in Chicago to provide closer cooperation with the Council. There is often a call for some one to state the reaction of the committee or to answer minor queries or to advise to whom a given question should be referred. The committee, therefore, recommends that Dr. Edward A. Oliver of Chicago be appointed a member of this committee.

In the increasing industrial activity in the present emergency it would seem that the work of the Council on Industrial Health will become of increasing importance. It can be assumed also that with so many individuals entering new jobs, with lack of training in cutaneous hazards and possible carelessness in handling materials there will be an increase in the number of cases of occupational dermatoses. The committee, therefore, plans to maintain the fullest cooperation with the Council in an attempt to provide for the early detection of cases, the proper interpretation of borderline conditions, and aid in prevention as far as possible.

Respectfully submitted.

C. GUY LANE, Chairman.  
HARRY R. FOERSTER, Secretary.  
CHARLES C. DENNIE.  
JOHN G. DOWNING.  
MARION B. SULZBERGER.

The chairman appointed the following committee to audit the books of the representative on Scientific Exhibit: Dr. Harold N. Cole, Cleveland; Dr. R. C. Jamieson, Detroit, and Dr. Loren W. Shaffer, Detroit.

Dr. Fred D. Weidman, Philadelphia, read the report of the American Board of Dermatology and Syphilology, as follows:

At the last meeting of the American Board of Dermatology and Syphilology in Chicago, Dec. 6 and 7, 1940, sixty-five candidates were examined. Of these, forty-five passed, twelve were conditioned and eight failed. Up to the present, five hundred and fifty-three diplomates of the Board have been certified.

At this meeting of the Board, Dr. Henry E. Michelson, Minneapolis, was elected to the Board as representative of the American Dermatological Association in place of Dr. Arthur

W. Stillians, Chicago, who retired, and Dr. Bedford Shelmire, Dallas, Texas, was elected as representative of the American Academy of Dermatology and Syphilology in place of Dr. Harold N. Cole, Cleveland, who retired.

In the last two years much progress has been made in the cooperative survey of graduate training facilities in Dermatology and Syphilology in this country. This survey has been made possible by the cooperation of the Council on Medical Education and Hospitals of the American Medical Association and this board. Sixty-six questionnaires were sent out to heads of dermatologic departments of the country. Questionnaires have been returned or replies received from all but eight institutions, so that a fair idea of the training of specialists in this field in this country has been obtained. The Board and Council have already approved twenty institutions as satisfactory for full three year training. There is, of course, considerable variation in these institutions in size, facilities, number of staff, new patients, total visits and so on. There is the variation in the clinical material, for example, in the number of new patients from almost 20,000 a year to a little over 1,000 a year, and a similar variation in total visits to the skin clinic from 114,000 down to 9,000 a year. In these twenty institutions, at the time the questionnaires were made out, there were one hundred and thirteen students in training in dermatology, and according to these questionnaires there were sixty-five places open each year. There are a few other institutions under consideration with reference to providing full three year training, but this is the situation as it stands at present.

The Board has under consideration the question of approving institutions for two year training and for one year training in the form of residencies, and there are about a dozen institutions now being reviewed by the Board and the Council with reference to classification in these groups. The number of students in the latter groups amount to twenty-five or thirty more, with perhaps twenty students accepted each year. Thus there are approximately one hundred and fifty students engaged in graduate training for the practice of dermatology and syphilology in these institutions which have been reviewed by the Board and the Council, and there are approximately eighty-five or ninety places open each year, according to these questionnaires.

The rush of requests for the sets of dermatologic histopathologic slides maintained by the Army Medical Museum makes it advisable that candidates who intend to take the next examination have their applications in the hands of the secretary of the Board as soon as possible and that application for the slides be made early in order that some of the candidates may not be deprived of the opportunity of using the slides just before the examination.

A new booklet has been published by the Board.

The next meeting of the Board will be held in New York on Dec. 12 and 13, 1941, during the time of the meeting of the American Academy of Dermatology and Syphilology.

At the recent meeting of the Board, held in April 1941 at New Orleans, the following five matters were decided on:

1. If a candidate is called into active military or naval service he will receive full credit for dermatologic training already finished at that time.

2. As far as counting as training in dermatology or syphilology any military or naval service, each case must of necessity be decided on the evidence submitted in the case of each particular candidate.

3. That the Board accept not more than one year of military service as part of the required two years experience in dermatology and syphilology to be eligible for examination.

4. A candidate who is called into military or naval service after completion of three years of training may take the complete examination of the Board, and that if this examination is satisfactory a certificate will be issued, after satisfactory completion of two years of further approved experience in dermatology and syphilology.

5. A candidate for a certificate may take the written examination at the next regular examination of the Board after he has completed three full years of training.

C. GUY LANE, Secretary.

Dr. Harold N. Cole, Cleveland, reported for the Auditing Committee that the financial statement of the Representative on Scientific Exhibit had been examined and found correct.

Dr. Fred D. Weidman, Philadelphia, placed in nomination Dr. Paul O'Leary, Rochester, Minn., to succeed himself on the American Board of Dermatology and Syphilology.

On motion by Dr. Marion B. Sulzberger, New York, duly seconded, it was voted that the number of members on the Committee on Industrial Dermatoses be increased from five to six, as recommended in the report of that committee, and that Dr. Edward A. Oliver, Chicago, be appointed the sixth member.

Drs. Robert R. Kierland and Paul A. O'Leary, Rochester, Minn., presented a paper on "Intraspinal Therapy of Neurosyphilis." Discussed by Drs. Harold N. Cole, Cleveland; Harry M. Robinson, Baltimore; Samuel W. Becker, Chicago; A. Benson Cannon, New York, and Robert R. Kierland, Rochester, Minn.

Drs. William Lcifer, Louis Chargin and Harold Thomas Hyman, New York, presented a paper on "Massive Dose Arsenotherapy in Early Syphilis by the Continuous Intravenous Drip Method."

Drs. David C. Elliott, Chicago; George Baehr, New York; Loren W. Shaffer, Detroit; Glenn S. Usher and S. Allan Lough, Washington, D. C., presented a paper on "An Evaluation of the Massive Dose Therapy of Early Syphilis."

These two papers were discussed by Drs. Evan W. Thomas, New York; Herbert Rattner, Chicago; George Baehr, New York; W. F. Spiller, Galveston, Texas; Maurice J. Strauss, New Haven, Conn.; Joseph F. Sadusk Jr., New Haven, Conn.; Samuel Goldblatt, Cincinnati; Arthur G. Schoch, Dallas, Texas; Leon Bromberg, St. Louis; Ira L. Schamberg, Ann Arbor, Mich.; Marion B. Sulzberger, New York; Harold N. Cole, Cleveland; Harold Thomas Hyman, New York, and David C. Elliott, Chicago.

Dr. Jack G. Hutton, Denver, read a paper on "Rocky Mountain Spotted Fever." Discussed by Drs. Robert J. Bailey, Spokane, Wash., and Jack G. Hutton, Denver.

Drs. Morris Waisman, Chicago, and Hamilton Montgomery, Rochester, Minn., presented a paper on "Verrucae Planae and Epithelial Nevi Including a Study of Epidermodysplasia Verruciformis." Discussed by Drs. Marcus Rayner Caro, Chicago; Adolph B. Loveman, Louisville, Ky.; Francis A. Ellis, Baltimore; Fred D. Weidman, Philadelphia, and Hamilton Montgomery, Rochester, Minn.

Drs. Samuel B. Frank and Charles R. Rein, New York, presented a paper on "Dyskeratoid Dermatoses." Discussed by Drs. M. H. Goodman, Baltimore; Nelson Paul Anderson, Los Angeles; Maximilian E. Obermayer, Chicago; Francis A. Ellis, Baltimore; Hamilton Montgomery, Rochester, Minn.; Fred D. Weidman, Philadelphia, and Charles R. Rein, New York.

#### FRIDAY, JUNE 6—AFTERNOON

Dr. Clyde L. Cummer, Cleveland, reported that the resolution presented at the Wednesday session had been introduced in the House of Delegates, which in turn eliminated the third paragraph regarding the chief of each special department being a medical officer holding a certificate from the appropriate national board in the specialty and referred it to the Committee on Medical Preparedness.

The following officers were elected: chairman, C. Ferd Lehmann, San Antonio, Texas; vice chairman, Paul E. Rechet, New York; secretary, Nelson Paul Anderson, Los Angeles; member of the American Board of Dermatology and Syphilology, Dr. Paul O'Leary, Rochester, Minn.

Dr. J. Gardner Hopkins, New York, moved a vote of thanks to the local committees, especially Dr. Cummer and Dr. Cole, for their kindness to visiting members. The motion was seconded and carried by a rising vote.

Drs. Maurice Sullivan and Jane Nicholls, Baltimore, presented a paper on "Nutritional Dermatoses in the Rat: VI. Signs and Symptoms Resulting from a Diet Containing Unheated, Dried Egg White as the Source of Protein." Dis-

cussed by Drs. Paul Gyorgy, Cleveland; Paul Gross, New York, and Maurice Sullivan, Baltimore.

Dr. Paul Gross, New York, read a paper on "Nummular Eczema: Its Clinical Picture and Successful Therapy." Discussed by Drs. Samuel W. Becker, Chicago; Everett C. Fox, Dallas, Texas; John G. Downing, Boston; Joseph Muller, Worcester, Mass.; Henry D. Niles, New York, and Paul Gross, New York.

Dr. Herman Goodman, New York, read a paper on "Rational Prescription Writing in Dermatology." Discussed by Dr. Torald H. Sollmann, Cleveland.

Drs. David Bloom, New York; Samuel R. Kaufman and Russel A. Stevens, Wilkes-Barre, Pa., presented a paper on "Hereditary Xanthomatosis: Familial Incidence of Xanthoma Tuberosum Associated with Hypercholesterolemia, Cardiovascular Involvement and Several Cases of Sudden Death." Discussed by Drs. Theodore Cornbleet, Chicago, and David Bloom, New York.

Drs. Duncan O. Poth and Sidney R. Kaliski, San Antonio, Texas, presented a paper on "Hormone Therapy in Tinea Capitis." Discussed by Drs. George M. Lewis, New York; Noah E. Aronstam, Detroit; Theodore Cornbleet, Chicago; C. Ferd Lehmann, San Antonio, Texas, and Duncan O. Poth, San Antonio, Texas.

### SECTION ON PREVENTIVE AND INDUSTRIAL MEDICINE AND PUBLIC HEALTH

#### WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Clarence D. Selby, Detroit.

Dr. Joseph W. Mountin, Washington, D. C., read a paper on "A Plea for Unity at the State Level." Discussed by Drs. R. H. Markwith, Columbus, Ohio; Henry A. Holle, Chicago; John A. Ferrell, New York; James N. Baker, Montgomery, Ala., and Joseph W. Mountin, Washington, D. C.

Dr. Dale C. Stahle, Harrisburg, Pa., read a paper on "A Clinical Analysis of Fifteen Thousand Cases of Pneumonia: An Evaluation of the Effectiveness of Various Therapeutic Agents." Discussed by Drs. John J. Shaw, Philadelphia; Jesse G. M. Bullowa, New York; Adolph Rumreich, Bethesda, Md., and Dale C. Stahle, Harrisburg, Pa.

Drs. Lewis Gregory Cole and William Gregory Cole, White Plains, N. Y., presented a paper on "Social and Economic Justice to Labor and Industry Alike in Pneumoconiosis, Based on Correlation of Roentgenologic and Pathologic Observations." Discussed by Drs. A. J. Lanza, New York, and Lewis Gregory Cole, White Plains, N. Y.

Drs. Harold L. Israel, H. W. Hetherington and John G. Ord, Philadelphia, presented a paper on "A Study of Tuberculosis Among Nursing Students." Discussed by Drs. H. C. Stewart, Cleveland; George J. Boines, Wilmington, Del., and Harold L. Israel, Philadelphia.

Dr. Theodore L. Bliss, Akron, Ohio, read a paper on "A Practical and Successful Tuberculosis Case-Finding Program for Nonmetropolitan Areas." Discussed by Drs. Robert E. Plunkett, Albany, N. Y., and Theodore L. Bliss, Akron, Ohio.

Dr. R. T. Legge, Berkeley, Calif., read the following resolution, recently adopted by the American Industrial Physicians and Surgeons, and presented to the Council on Industrial Health:

WHEREAS, There has been a marked increase in the number of physicians and surgeons devoting their services to the practice of industrial medicine and surgery; and

WHEREAS, There are at present several universities offering courses and many universities contemplating the establishment of departments to offer courses in the practice of industrial medicine and surgery; and

WHEREAS, The American Medical Association has recognized the importance of this special type of practice by the establishment of the Council on Industrial Health with its many diversified activities in this specialty field; be it

Resolved, That the American Association of Industrial Physicians and Surgeons recommend the appointment of a committee of three members of this association to cooperate with a similar committee from the related section of the American Medical Association to further the establishment of an American Board of Industrial Medicine and Surgery and to seek the approval for this American Board of Industrial Medicine and Surgery by the Advisory Board for Medical Specialties.

Dr. Legge said that the committee appointed by the American Industrial Physicians and Surgeons was Drs. Edward C. Holmblad, Chicago; Frederick William Slobe, Chicago, and Volney S. Cheney, Chicago.

Dr. Legge moved that the resolutions be presented to the section for adoption. The motion was regularly seconded. The chairman suggested that the resolutions be referred to the executive committee to be referred back tomorrow. The motion was put to a vote and was carried.

#### THURSDAY, JUNE 5—MORNING

The chairman read a telegram from Dr. Huntington Williams, Baltimore, vice chairman of the section, regretting his inability to be present.

The following officers were elected: chairman, Dr. Haven Emerson, New York; vice chairman, Dr. Joseph W. Mountin, Washington, D. C.; secretary, Dr. W. A. Sawyer, Rochester, N. Y.; executive committee: Dr. Harold S. Diehl, Minneapolis; Dr. Clarence D. Selby, Detroit, and Dr. Haven Emerson, New York; delegate, Dr. Stanley H. Osborn, Hartford, Conn.; alternate, Dr. Leverett Dale Bristol, New York; chairman, Committee on Section Exhibit, Dr. Paul Arthur Davis, Akron, Ohio.

Dr. I. C. Riggan, Richmond, Va., reported for the executive committee, to which the resolutions presented by the Association of Industrial Physicians and Surgeons at the Wednesday session were referred, recommending that the section cooperate and work with the association and suggesting that the following members of the section by the chairman as a committee to work with the association: Drs. Leverett Dale Bristol, New York; R. T. Legge, Berkeley, Calif., and W. A. Sawyer, Rochester, N. Y.

On motion made by Dr. I. C. Riggan, Richmond, Va., it was voted that the section adopt a suitable resolution signifying its willingness and desire to cooperate with the Association of Industrial Physicians and Surgeons, and that the chairman of the section be authorized to appoint Drs. Bristol, Legge and Sawyer as a committee to represent the section in working with the association.

Dr. Haven Emerson, New York, presented the following memorial at the request of Dr. Chesley and of members of the American Epidemiological Society:

#### Charles Value Chapin 1856-1941

About the end of the last century and the beginning of the current one, public health was quite generally regarded as a just barely respectable "job," routine and somnolent; in process of being nudged into unwilling half-awakeness by the eager, enterprising interloper Bacteriology, itself then only half hatched, its "sea legs" still to be found.

The Superintendent of Health and Registrar of a small city in the smallest state of the Union, on a small salary and with small facilities (except an illimitable courage and an inimitable brain) undertook single handed to introduce thinking into somnolence, clearcut objectives into blindfold routine; the vital use, not the mere piling up of vital statistics; incidentally asking of all practicing public health departments first how they practiced (which many answered) and then why, to which latter question the answers were chiefly (and probably very discreetly) silence; indeed, in public health circles Why was then very generally considered a question almost blasphemous, surely impertinent or ignorant, or just silly.

The writer remembers, with deep feeling, private comments by public health men on two of Chapin's earlier findings—that terminal disinfection accomplished nothing except the unwarranted conveyance of a harmful illusion of safety; that typhoid fever did not come from water but always from people, though sometimes through water, and also sometimes through other things.

The commentators disagreed usually on one point only, i. e. as to whether, within the next two years, Chapin would arrive

(a) in an asylum or (b) in jail. One of these very regrettable and long-since very regretful commentators was the present writer himself [REPORTER'S NOTE.—Dr. Emerson is not the writer]. In the face then of innumerable critics all keenly watchful and nearly all confidently expectant of "inevitable" disaster, Chapin calmly abolished terminal disinfection in his own bailiwick, Providence, Rhode Island, knowing well (private letter) that if any even fortuitous, perfectly casual epidemic should occur in Providence within a year or two he would be done, professionally and personally. But the Fates were kind to public health, and terminal disinfection, not Chapin, was discarded everywhere, finally.

The foremost epidemiologist of a day when epidemiology was lucky to find some persons who could spell it, although very few even of these could define it; the leader ever since in teaching the fundamentals of the epidemiologies of today, even before they were generally recognized as epidemiological; most cautious and careful in research, most prompt, bold and incisive in action, Charles Value Chapin was—is—the greatest and most generously helpful of all creditors; to whom public health men have owed for more than a third of a century a growing debt that on Jan. 31, 1941 became forever, alas, quite unpayable. (Anon.)

It was the consensus that the foregoing memorial be spread on the minutes, and, at the suggestion of Dr. Harold B. Wood, Harrisburg, Pa., that a copy of it be sent to Mrs. Chapin and that it be printed in THE JOURNAL.

On motion made by Dr. Leverett Dale Bristol, New York, it was voted that the executive committee of the section be authorized to create a cooperating committee on industrial health to work with the Council on Industrial Health in matters of mutual interest.

Dr. Clarence D. Selby, Detroit, read the chairman's address, entitled "Industrial Hygiene Marches On."

Dr. Edgar V. Allen, Rochester, Minn., read a paper on "The Health of Business and Professional Men." Discussed by Drs. Reginald Fitz, Boston; L. G. Rowntree, Philadelphia; Joseph W. Mountin, Washington, D. C.; Millard Knowlton, Hartford, Conn.; Harold S. Diehl, Minneapolis; Leverett Dale Bristol, New York, and Edgar V. Allen, Rochester, Minn.

Dr. W. H. Lipman, Chicago, read a paper on "U. S. Government Meat Inspection After a Third of a Century." Discussed by Dr. Edward Himself, Cleveland.

Drs. W. F. Wells, M. W. Wells and T. S. Wilder, Philadelphia, presented a paper on "The Environmental Control of Epidemic Contagion: I. Schools." Discussed by Drs. James E. Perkins, Albany, N. Y., and William A. Sawyer, Rochester, N. Y.

Drs. John L. Rice, Alfred Cohn, Arthur Steer and Eleanor L. Adler, New York, presented a paper on "Recent Investigations on Gonococcal Vaginitis." Discussed by Drs. Reuel A. Benzon, New York; Goodrich C. Schaffner, Portland, Ore.; Haven Emerson, New York; Carl A. Wilzbach, Cincinnati, and Alfred Cohn, New York.

Dr. Reginald Fitz, Boston, read a paper on "Interns and Their Health." Discussed by Drs. Haven Emerson, New York; Harold S. Diehl, Minneapolis, and Reginald Fitz, Boston.

#### FRIDAY, JUNE 6—MORNING

A joint meeting was held with the Section on Pediatrics.

The following papers were read in a panel discussion, during which Dr. Haven Emerson, New York, presided:

Dr. Benjamin M. Spock, New York: "Uses and Abuses of School Medical Examinations."

Dr. Harry S. Gradle, Chicago: "Eye Examinations in Public Schools."

Dr. Abraham H. Kantrow, Astoria, Long Island, N. Y.: "The School Health Service and the Private Physician."

Dr. George M. Wheatley, Plandome, Long Island, N. Y.: "Communicable Disease and the School."

Dr. M. R. Kindig, Battle Creek, Mich.: "Communicable Disease Control."



## SECTION ON UROLOGY

WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9:10 by the chairman, Dr. Meredith F. Campbell, New York.

Dr. Joseph P. Evans, Cincinnati, read a paper on "The Physiologic Basis of the Neurogenic Bladder."

Dr. Michael Kinney O'Heeron, Houston, Texas, read a paper on "Cystometry: Its Value and Limitations."

Drs. John L. Emmett and J. Byron Beare, Rochester, Minn., presented a paper on "Bladder Difficulties in the Tabetic Patient with Special Reference to Surgical Treatment by Transurethral Resection."

Drs. Reed M. Nesbit and William G. Gordon, Ann Arbor, Mich., presented a paper on "Surgical Treatment of the Autonomous Neurogenic Bladder."

Dr. Carlisle F. Schroeder, Detroit, read a paper on "Presacral (Superior Hypogastric) Neurectomy: Its Value and Limitations."

These five papers were discussed by Drs. William P. Herbst, Washington, D. C.; Lloyd G. Lewis, Baltimore; Herbert Ellis Landes, Chicago; Frederick C. McLellan, New York; Irving Simons, New York; Harold C. Voris, Chicago; Joseph D. Evans, Cincinnati; Michael Kinney O'Heeron, Houston, Texas; John L. Emmett, Rochester, Minn.; William G. Gordon, Ann Arbor, Mich., and Carlisle F. Schroeder, Detroit.

THURSDAY, JUNE 5—MORNING

Drs. John H. Powers and Marjorie F. Murray, Cooperstown, N. Y., presented a paper on "Juvenile Hypertension Associated with Congenital and Inflammatory Lesions of the Upper Urinary Tract."

Dr. George M. Fister, Ogden, Utah, read a paper on "Fibrosis and Submucous Calcification of the Vesical Neck."

These two papers were discussed by Drs. Herbert Beach Wright, Cleveland; Marjorie F. Murray, Cooperstown, N. Y., and George M. Fister, Ogden, Utah.

Dr. Meredith F. Campbell, New York, read the chairman's address, entitled "Resection of the Kidney."

Dr. Roy B. Henline read a paper on "The Surgical Treatment of Prostatic Disease." Discussed by Drs. Hermon C. Bumpus, Pasadena, Calif.; Charles C. Higgins, Cleveland; George Franklin Farman, Los Angeles; Victor D. Lespinasse, Chicago, and Roy B. Henline, New York.

Dr. Elmer Hess, Erie, Pa., read a paper on "Renal Sympathectomy: An Evaluation of Fifteen Years' Experience."

Drs. John Hartwell Harrison and Orville T. Bailey, Boston, presented a paper on "The Significance of Necrotizing Pyelonephritis in Diabetes Mellitus."

These two papers were discussed by Drs. Thomas P. Shupe, Cleveland; William P. Herbst, Washington, D. C., and Orville T. Bailey, Boston.

FRIDAY, JUNE 6—MORNING

The following officers were elected: chairman, Dr. Vincent J. O'Connor, Chicago; vice chairman, Dr. Gershom Thompson, Rochester, Minn.; secretary, Dr. Grayson L. Carroll, St. Louis; delegate, Dr. Hermon C. Bumpus, Pasadena, Calif.; alternate, Dr. Carl Rusch, Los Angeles.

Drs. Ferdinand Welebir and Roger W. Barnes, Los Angeles, presented a paper on "The Use of P-Sulfanil-Acetyl-Imide in the Treatment of E. Coli Urinary Tract Infections."

Dr. William Bromme, Detroit, read a paper on "The Chemotherapy of Gonorrheal Urethritis in the Male."

These two papers were discussed by Drs. Edward Noble Cook, Rochester, Minn.; Edwin Pascal Alyca, Durham, N. C.; W. Ray Jones, Seattle; Victor D. Lespinasse, Chicago; Walter M. Simpson, Dayton, Ohio; Roger W. Barnes, Los Angeles, and William Bromme, Detroit.

Drs. J. Sydney Ritter, New York, and Samuel E. Kramer, Perth Amboy, N. J., presented a paper on "Modern Urologic Pharmacology." Discussed by Drs. John H. Morrissey, New York; Walter M. Kearns, Milwaukee, and J. Sydney Ritter, New York.

Drs. Gray H. Twombly, Harold L. Temple and Archie L. Dean Jr., New York, presented a paper on "The Clinical Value of the Aschheim-Zondek Test in Testicular Tumors." Dis-

cussed by Drs. Joseph H. Kiefer, Chicago; J. B. Gilbert, Schenectady, N. Y.; Grayson L. Carroll, St. Louis, and Gray H. Twombly, New York.

Dr. Roy Pelham Finney, Spartanburg, S. C., read a paper on "The Principle of Traction in the Treatment of Ureteral Stone." Discussed by Drs. Victor D. Lespinasse, Chicago; George R. Livermore, Memphis, Tenn.; Hermon C. Bumpus, Pasadena, Calif., and Roy Pelham Finney, Spartanburg, S. C.

Dr. Lowrain E. McCrea, Philadelphia, read a paper on "The Value of Cystoscopic Photography in Medicine."

## SECTION ON ORTHOPEDIC SURGERY

WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. J. Albert Key, St. Louis.

Dr. M. Beckett Howorth, New York, read a paper on "Leg Shortening." Discussed by Dr. Joseph A. Freiberg, Cincinnati.

Drs. Charley J. Smyth, Richard H. Freyberg and Isadore Lampe, Ann Arbor, Mich., presented a paper on "Roentgen Therapy for Rhizomelic Spondylitis, from the Rackham Arthritis Research Unit, and the Department of Radiology, the Medical School, University of Michigan." Discussed by Drs. Bernard I. Comroe, Philadelphia; Carl E. Badgley, Ann Arbor, Mich., and Charley J. Smyth, Ann Arbor, Mich.

Dr. Henry W. Meyerding, Rochester, Minn., read a paper on "Benign and Malignant Giant Cell Tumors: Diagnosis and Result of Treatment." Discussed by Dr. Theodore A. Willis, Cleveland.

Dr. Frederiek A. Jostes, St. Louis, read a paper on "Neck Pain: Laminography as an Aid to the Diagnosis of Atlanto-Occipital Lesions." Discussed by Drs. W. Edward Chamberlain, Philadelphia; Sherwood Moore, St. Louis; Marius N. Smith-Petersen, Boston, and Frederick A. Jostes, St. Louis.

Drs. Lenox D. Baker and Chester H. Waters Jr., Durham, N. C., presented a paper on "Vitallium Cup Arthroplasty of the Hip: A Preliminary Report on the Results in Sixteen Patients with Nineteen Arthroplasties." Discussed by Drs. Marius N. Smith-Petersen, Boston; G. Mosser Taylor, Los Angeles; Hugh Smith, Memphis, Tenn.; Carl E. Badgley, Ann Arbor, Mich., and Lenox D. Baker, Durham, N. C.

Drs. William T. Green and Leo J. McDermott, Boston, presented a paper on "Operative Treatment of Cerebral Palsy of Spastic Type." Discussed by Drs. Beveridge H. Moore, Chicago; Manuel E. Pusitz, Topcka, Kan., and William T. Green, Boston.

THURSDAY, JUNE 5—MORNING

Drs. Roland Hammond, Providence, R. I., and Denis S. O'Connor, New Haven, Conn., presented a paper on "Occult Fractures." Discussed by Drs. Walter C. Hill, Cleveland; Charles N. Pease, Chicago, and Roland Hammond, Providence, R. I.

Drs. Edward L. Compere, Chicago, and George T. Wallace, Spokane, Wash., presented a paper on "The Choice of Materials for Internal Fixation of Fractures of the Neck of the Femur." Discussed by Drs. Austin T. Moore, Columbia, S. C.; Rudolph S. Reich, Cleveland, and Edward L. Compere, Chicago.

Dr. J. Albert Key, St. Louis, read the chairman's address, entitled "The Use of Sulfanilamide and Sulfathiazole in Orthopedic Surgery."

Dr. David M. Bosworth, New York, read a paper on "The Supraspinatus Syndrome: Symptomatology, Pathology and Repair." Discussed by Drs. Joseph J. Kurlander, Cleveland; Laurence Jones, Kansas City, Mo., and David M. Bosworth, New York.

The following officers were elected: chairman, James A. Dickson, Cleveland; vice chairman, Guy A. Caldwell, New Orleans; secretary, Francis M. McKeever, Los Angeles; executive committee: Robert V. Funsten, Charlottesville, Va.; J. Albert Key, St. Louis, and James A. Dickson, Cleveland; delegate, James Archer O'Reilly, St. Louis; alternate, J. E. M. Thomson, Lincoln, Neb.

Dr. James Archer O'Reilly, St. Louis, gave a report as delegate to the House of Delegates.

The chairman appointed Drs. James Archer O'Reilly, St. Louis, and Frederick A. Jostes, St. Louis, as a committee to

draft memorial resolutions on the death of Dr. Willis C. Campbell, Memphis, Tenn., to be sent to the Campbell Clinic and to the family of Dr. Campbell.

It was voted that the chairman appoint a committee to represent the section on the Committee of Industrial Health and Hygiene, and the chairman appointed Drs. E. J. Berckheiser, Chicago; W. P. Blount, Milwaukee, and Edward L. Compere, Chicago.

Drs. Walter A. Hoyt and Adrian E. Davis, Akron, Ohio, presented a paper on "The Treatment of Acute Osteomyelitis by Sulfathiazole Without Operation." Discussed by Drs. Clarence H. Heyman, Cleveland; Carl E. Badgley, Ann Arbor, Mich.; Lenox D. Baker, Durham, N. C.; Frederick A. Jostes, St. Louis, and Walter A. Hoyt, Akron, Ohio.

#### FRIDAY, JUNE 6—MORNING

A joint meeting was held with the Section on Surgery, General and Abdominal.

Drs. Jonathan E. Rhoads and M. T. Fliegelman, Philadelphia, presented a paper on "The Mechanism of Delayed Wound Healing in the Presence of Hypoproteinemia." Discussed by Drs. Charles G. Johnston, Detroit, and Jonathan E. Rhoads, Philadelphia.

Drs. Virgil H. Moon, D. R. Morgan, Marshall M. Lieber and Donald J. McGrew, Philadelphia, presented a paper on "Similarities and Distinctions Between Shock and the Effects of Hemorrhages." Discussed by Dr. Henry N. Harkins, Detroit.

Drs. D. Henry Poer and Ira A. Ferguson, Atlanta, Ga., and Edward Woliver, Cincinnati, presented a paper on "Traumatic Rupture of the Intestine Due to Nonpenetrating Wounds of the Abdomen." Discussed by Dr. W. L. Estes Jr., Bethlehem, Pa.

Dr. Hugh Smith, Memphis, Tenn., read a paper which he had prepared in cooperation with the late Dr. Willis C. Campbell, entitled "Fresh Compound Fractures: Treatment by Sulfadiazine and by Internal Fixation in Selected Cases." Discussed by Drs. Harold R. Bohlman, Baltimore; John E. Cannaday, Charleston, W. Va., and Hugh Smith, Memphis, Tenn.

The chairman eulogized the late Dr. Willis C. Campbell, and the audience stood for a moment in silence in respect for his memory.

Dr. Frank J. Cox, New Orleans, read a paper on "The Splinting of Compound Fractures." Discussed by Drs. H. A. Swart, Charleston, W. Va., and Frank J. Cox, New Orleans.

Dr. Rex L. Diveley, Kansas City, Mo., read a paper on "Chemotherapy in the Treatment of Compound Fractures." Discussed by Drs. Francis M. McKeever, Los Angeles; Robert W. Johnson Jr., Baltimore, and Rex L. Diveley, Kansas City, Mo.

### SECTION ON GASTRO-ENTEROLOGY AND PROCTOLOGY

#### WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Frank C. Yeomans, New York.

The following papers were read as a Symposium on Mouth Lesions:

Dr. Burrill Bernard Crohn, New York: "Halitosis."

Dr. Louis A. Rosenblum, New York: "Lesions of the Mouth Associated with Deficiency Diseases."

Dr. Benjamin F. Miller, Chicago: "Observations on Human Dental Caries."

These three papers were discussed by Drs. A. H. Aaron, Buffalo; Thomas T. Mackie, New York; Walter H. Shealy, Sharpsburg, Md.; Louis A. Rosenblum, New York, and Benjamin F. Miller, Chicago.

The following papers were read in a Panel Discussion on Drug Therapy in the Alimentary Tract, during which Dr. Sara M. Jordan, Boston, presided:

Dr. Donald H. Slaughter, Dallas, Texas: "Control of Gastrointestinal Function by Centrally Acting Drugs."

Dr. Harry Gold, New York: "Control of Gastrointestinal Function by Drugs Acting Peripherally."

Dr. James W. Morgan, San Francisco: "Harmful Effects of Mineral Oil Purgatives."

Dr. Ernest Carroll Faust, New Orleans: "The Chemotherapy of Intestinal Parasites."

#### THURSDAY, JUNE 5—AFTERNOON

Dr. Frank C. Yeomans, New York, read the chairman's address, entitled "Proctology: Its Field and Qualifications."

The following papers were read as a Symposium on Lesions of the Rectum and Large Intestine:

Dr. Montague S. Woolf, San Francisco: "Morbidity and Mortality After Resections of the Rectum."

Dr. Jack G. Kerr, Dallas, Texas: "Squamous Cell Carcinomas of the Anorectal Region."

Dr. Louis J. Hirschman, Detroit: "The Colostomy Question."

These three papers were discussed by Drs. Neil W. Swinton, Boston; G. Johnson Hamilton, New York; Clement L. Martin, Chicago; Descum C. McKenney, Buffalo; Thomas E. Jones, Cleveland; William H. Daniel, Los Angeles; C. Alexander Hellwig, Wichita, Kan.; Claude C. Tucker, Wichita, Kan.; Frank C. Yeomans, New York; Montague S. Woolf, San Francisco; Jack G. Kerr, Dallas, Texas, and Louis J. Hirschman, Detroit.

Drs. Charles W. Mayo and Edward Starr Judd Jr., Rochester, Minn., presented a paper on "Resection of the Right Colon for Nonspecific Ileocolitis." Discussed by Drs. Max Thorek, Chicago; Burrill Bernard Crohn, New York, and Charles W. Mayo, Rochester, Minn.

Drs. Enid Rodaniche, Joseph Barnett Kirsner and Walter L. Palmer, Chicago, presented a paper on "Studies on Lymphopathia Venereum Infections of the Rectum." Discussed by Drs. Herbert T. Hayes, Houston, Texas; Moses Paulson, Baltimore; Arthur W. Grace, New York; Zacharias Bercovit, New York; Harold F. Sawyer, Detroit, and Walter L. Palmer, Chicago.

Dr. Michael H. Streicher, Chicago, read a paper on "Clinical Summary of the Management of Nine Hundred and Twelve Cases of Chronic Ulcerative Colitis." Discussed by Drs. Martin S. Kleckner, Allentown, Pa.; Zacharias Bercovit, New York; Isaac R. Jankelson, Boston; J. A. Bergen, Rochester, Minn.; David J. Sandweiss, Detroit, and Rachelle Seletz, Los Angeles.

#### FRIDAY, JUNE 6—AFTERNOON

The following officers were elected: chairman, Dr. Walter L. Palmer, Chicago; vice chairman, Dr. Emmett H. Terrell, Richmond, Va.; secretary, Dr. Sara M. Jordan, Boston; executive committee: Dr. A. H. Aaron, Buffalo; Dr. Frank C. Yeomans, New York, and Dr. Walter L. Palmer, Chicago; delegate, Dr. Louis A. Buie, Rochester, Minn.; alternate, Dr. Walter A. Fansler, Minneapolis; chairman Committee on Section Exhibit, Dr. Grant H. Laing, Chicago.

Dr. Harold O. Hofmeyr, Capetown, Union of South Africa, read a paper on "The History of Vitamin C Deficiency in the South African Native."

The following papers were read as a Symposium on Studies on the Stomach:

Drs. Henry A. Rafsky and Michael Weingarten, New York: "Clinical Appraisal of Various Methods of Treating Bleeding Peptic Ulcer, Based on a Series of Four Hundred Cases."

Dr. Albert F. R. Andresen, Brooklyn: "Intractable Peptic Ulcers: Are They a Surgical or a Medical Problem?"

Dr. George B. Eusterman, Rochester, Minn.: "Carcinomatous Gastric Ulcer: Misleading Results of Medical Therapy."

These three papers were discussed by Drs. Nathaniel E. Reich, Brooklyn; John Day Garvin, Pittsburgh; James F. Weir, Rochester, Minn.; Sara M. Jordan, Boston; Sidney A. Portis, Chicago; J. Shelton Horsley, Richmond, Va.; Everett D. Kiefer, Boston; David J. Sandweiss, Detroit; Henry A. Rafsky, New York; Albert F. R. Andresen, Brooklyn, and George B. Eusterman, Rochester, Minn.

Drs. Allan L. Cohn, Alfred S. White and Helen B. S. Weyrauch, San Francisco, presented a paper on "Kaolin Granuloma of the Stomach."

Drs. Frank E. Hamilton and George Morris Curtis, Columbus, Ohio, presented a paper on "Clinical Indications for Inducing Gastric Hypomotility."

Dr. Leonidas H. Berry, Chicago, read a paper on "Evaluation of the Concept 'Chronic Alcoholic Gastritis' with Gastroscopic Studies of One Hundred Cases."

These three papers were discussed by Drs. David J. Sandweiss, Detroit; Howard T. Karsner, Cleveland; Roby John F. Renshaw, Cleveland; Herman J. Moersch, Rochester, Minn.; Walter L. Palmer, Chicago; Allan L. Colin, San Francisco; Frank E. Hamilton, Columbus, Ohio, and Leonidas H. Berry, Chicago.

## SECTION ON RADIOLOGY

WEDNESDAY, JUNE 4—AFTERNOON

The meeting was called to order at 2 o'clock by the chairman, Dr. Raymond C. Beeler, Indianapolis.

Dr. C. C. Birkelo, Detroit, read a paper on "The Roentgen Diagnosis of the Primary Tuberculous Infection."

Dr. Horton R. Casparis, Nashville, Tenn., read a paper on "So-Called Childhood Tuberculosis: What Is It?"

These two papers were discussed by Drs. Frederiek Slyfield, Seattle; Ralph S. Bromer, Bryn Mawr, Pa.; C. C. Birkelo, Detroit, and Horton R. Casparis, Nashville, Tenn.

Dr. Richard H. Overholt, Brookline, Mass., read a paper on "Advantages of Permanent Collapse Therapy in Pulmonary Tuberculosis." Discussed by Drs. Edward J. O'Brien, Detroit, and Richard H. Overholt, Brookline, Mass.

Drs. Leo G. Rigler and Chauncey N. Bornan, Minneapolis, and John F. Noble, St. Paul, presented a paper on "Gallstone Obstruction: Pathogenesis and Roentgen Manifestations." Discussed by Drs. James T. Case, Chicago, and Leo G. Rigler, Minneapolis.

Drs. Joseph S. Barr, James R. Lingley and Edward A. Gall, Boston, presented a paper on "A Study of the Effect of Roentgen Irradiation on the Epiphyses of the Albino Rat." Discussed by Drs. Rollin H. Stevens, Detroit; John T. Murphy, Toledo, Ohio, and Edward A. Gall, Boston.

THURSDAY, JUNE 5—AFTERNOON

Dr. Raymond C. Beeler, Indianapolis, read the chairman's address, entitled "Some Immediate Problems Facing the Radiologist."

Dr. Thomas T. Mackie, New York, read a paper on "Vitamin Deficiencies and the Small Intestine."

Dr. Ross Golden, New York, read a paper on "The Small Intestine in Vitamin B Deficiency."

Dr. Michael J. Lepore, New York, read a paper on "A Syndrome Due to Deficiency of the Vitamin B Complex."

Dr. C. Allen Good, Rochester, Minn., read a paper on "Tumefactive Lesions of the Small Intestine."

These four papers were discussed by Drs. Eugene P. Pendergrass, Philadelphia; David Adlersberg, New York; Merrill C. Sosman, Boston; Ross Golden, New York; Michael J. Lepore, New York, and C. Allen Good, Rochester, Minn.

FRIDAY, JUNE 6—AFTERNOON

The following officers were elected: chairman, Dr. Ralph S. Bromer, Bryn Mawr, Pa.; vice chairman, Dr. Lyell C. Kinney, San Diego, Calif.; secretary, Dr. John T. Murphy, Toledo, Ohio; executive committee: Dr. Merrill C. Sosman, Boston; Dr. Raymond C. Beeler, Indianapolis, and Dr. Ralph S. Bromer, Bryn Mawr, Pa.

The chairman, Dr. Raymond C. Beeler, Indianapolis, read a letter from Dr. Carl M. Peterson, secretary of the Council on Industrial Health, American Medical Association, suggesting that the Section on Radiology appoint a committee to work in close relationship with the Council on Industrial Health with regard to problems confronting anesthetists in relation to industrial practice.

On motion made by Dr. J. W. Picrson, Baltimore, and regularly seconded, it was voted that the incoming chairman be empowered to appoint a committee of three for this purpose.

Drs. Julius B. Abels, John S. Kenney and Mr. L. D. Marinelli, New York, presented a paper on "Postirradiation Changes in the Levels of Organic Phosphorus in the Blood of Patients with Leukemia." Discussed by Edith Quimby, M.A., New York, and Dr. John S. Kenney, New York.

Drs. Leonard A. Scheele and Dean B. Cowie, Bethesda, Md., presented a paper on "Radiation Protection in Forty-Five Hospitals." Discussed by Edith Quimby, M.A., New York, and Drs. John T. Murphy, Toledo, Ohio, and Leonard A. Scheele, Bethesda, Md.

Drs. Robert E. Fricke and Charles O. Heilman, Rochester, Minn., presented a paper on "Results of Radium Treatment of Cancer of the Uterine Fundus with Special Reference to the Microscopic Grade of the Lesion." Discussed by Drs. U. V. Portmann, Cleveland, and Robert E. Fricke, Rochester, Minn.

Dr. William V. Tenzel, New York, read a paper on "Radiation Therapy in Carcinoma of the Lung."

Dr. Orville N. Meland, Los Angeles, read a paper on "The Influence of Radiation on Longevity in Cancer of the Breast." Discussed by Drs. U. V. Portmann, Cleveland; John E. Wirth, Baltimore, and Orville N. Meland, Los Angeles.

## SECTION ON ANESTHESIOLOGY

WEDNESDAY, JUNE 4—MORNING

The meeting was called to order at 9 o'clock by the chairman, Dr. Ralph M. Waters, Madison, Wis.

The secretary, Dr. John S. Lundy, Rochester, Minn., read letters of congratulation on the organization of the section from the secretaries of the Sections on Pediatrics; Laryngology, Otology and Rhinology; Urology; Gastro-Enterology and Proctology; Practice of Medicine; Pharmacology and Therapeutics; Ophthalmology; Nervous and Mental Diseases; Preventive and Industrial Medicine and Public Health; Dermatology and Syphilology, and Surgery, General and Abdominal.

The vice chairman, Dr. T. J. Collier, Atlanta, Ga., read a letter of congratulation from Mr. Thomas E. Keys, reference librarian, Mayo Clinic.

Greetings were extended by Drs. Samuel Johnston, Toronto, Ont.; Frank H. Lahey, Boston, incoming President, American Medical Association; James E. Paullin, Atlanta, Ga., chairman, Council on Scientific Assembly; Morris Fishbein, Chicago, Editor, *THE JOURNAL*, and Nathan B. Van Etten, New York, Past President, American Medical Association.

Dr. Walter C. Alvarez, Rochester, Minn., read a paper on "The Men Who Discovered Anesthesia." Discussed by Drs. John H. Evans, Buffalo; Ansel M. Caine, New Orleans; F. M. Summerville, Oil City, Pa.; W. Allen Conroy, Edmonton, Alta., and Walter C. Alvarez, Rochester, Minn.

Drs. Ralph M. Tovell and Joseph E. Remlinger, Hartford, Conn., presented a paper on "History and Present Status of Oxygen Therapy and Resuscitation." Discussed by Drs. Alvan L. Barach, New York; Frederiek A. D. Alexander, Albany, N. Y.; Ralph T. Knight, Minneapolis, and Ralph M. Tovell, Hartford, Conn.

Dr. H. Boyd Stewart, Tulsa, Okla., read a paper on "The Volatile Anesthetics: Ether, Divinyl Ether, Chloroform and Ethyl Chloride." Discussed by Drs. Samuel Johnston, Toronto, and H. Boyd Stewart, Tulsa, Okla.

The secretary read a telegram from Dr. Paluel J. Flagg, New York, who was scheduled to discuss this paper.

THURSDAY, JUNE 5—MORNING

Dr. Ralph M. Waters, Madison, Wis., read the chairman's address, entitled "The Chemical Absorption of Carbon Dioxide from Anesthetic Atmospheres."

Drs. Achilles L. Tynes, Washington, D. C.; William W. Nichol, San Francisco, and Sidney C. Wiggin, Boston, presented a paper on "Anesthesia for Military Needs." Discussed by Drs. George W. Crile, Cleveland; Douglas B. Kendrick,

Washington, D. C.; Lyman Weeks Crossman, Red Bank, N. J.; Philip D. Woodbridge, New Haven, Conn., and Achilles L. Tynes, Washington, D. C.

Dr. Urban H. Eversole, Boston, read a paper on "Anesthesia for Surgery About the Head." Discussed by Drs. Frederick W. Clement, Toledo, Ohio; B. Burdell Sankey, East Cleveland, Ohio, and Urban H. Eversole, Boston.

Dr. Paul W. Searles, Buffalo, read a paper on "Intravenous Anesthesia." Discussed by Drs. Rolland J. Whitacre, East Cleveland, Ohio; George J. Thomas, Pittsburgh; James I. Yanick, Hornell, N. Y.; Harold D. Green, Cleveland; F. M. Summerville, Oil City, Pa., and Paul W. Searles, Buffalo.

Dr. Virginia Apgar, New York, explained that illness prevented Dr. James T. Gwathmey, New York, from attending and presenting his scheduled paper on "Anesthesia and Analgesia by Ether and Various Drugs Rectally."

#### FRIDAY, JUNE 6—MORNING

The following officers were elected: chairman, Dr. T. J. Collier, Atlanta, Ga.; vice chairman, Dr. Fayette E. Hubbard, Montclair, N. J.; secretary, Dr. John S. Lundy, Rochester, Minn.; executive committee: Dr. Henry S. Ruth, Merion Station, Pa.; Dr. Ralph M. Waters, Madison, Wis., and Dr. T. J. Collier, Atlanta, Ga.; representative to committee on Scientific Exhibits, Dr. Paul M. Wood, New York; delegate, Dr. Henry S. Ruth, Merion Station, Pa.; alternate, Dr. Charles F. McCuskey, Glendale, Calif.

On motion made by Dr. Emery A. Rovenstine, New York, and regularly seconded, it was voted that the Section on Anesthesiology accept the function, previously exercised by the Section on Surgery, General and Abdominal, of nominating delegates to the American Board of Anesthesiology.

The secretary, Dr. I. S. Lundy, Rochester, Minn., read a letter from the secretary of the American Board of Anesthesiology, requesting that permission be granted to the American Society of Anesthetists to nominate four representatives to the American Board of Anesthesiology, in place of three, as the Pacific Coast Association of Anesthetists is no longer active.

On motion made by Dr. Philip D. Woodbridge, New Haven, Conn., and regularly seconded, it was voted that this permission be granted.

The delegate, Dr. Henry S. Ruth, Merion Station, Pa., gave a brief report on the proceedings of the House of Delegates.

Dr. Emery A. Rovenstine, New York, read a paper on "Therapeutic Nerve Block." Discussed by Drs. Charles F. McCuskey, Glendale, Calif.; Brian C. Sword, New York; Paul W. Searles, Buffalo; Urban H. Eversole, Boston, and Emery A. Rovenstine, New York.

Drs. Henry S. Ruth, Merion Station, Pa.; Ivan B. Taylor and Frederick P. T. Haugen, Philadelphia, presented a paper on "Serial Spinal Anesthesia." Discussed by Drs. William T. Lemmon, Philadelphia; Philip D. Woodbridge, New Haven, Conn., and Ivan B. Taylor, Philadelphia.

Drs. Clayton P. Wangeman and Malcolm H. Hawk, Madison, Wis., presented a paper on "Effects on Human Respiration of Morphine, Atropine and Scopolamine Alone and Combined." Discussed by Drs. Dennis E. Jackson, Cincinnati; Ivan B. Taylor, Philadelphia, and Clayton P. Wangeman, Madison, Wis.

Dr. Harvey C. Slocum, Madison, Wis., read a paper on "An Apparatus for the Automatic Recording of Diastolic and Systolic Blood Pressure in Clinical Practice." Discussed by Drs. John K. Potter, East Cleveland, Ohio; John S. Lundy, Rochester, Minn.; Ivan B. Taylor, Philadelphia, and Harvey C. Slocum, Madison, Wis.

Dr. Thomas H. Seldon, Rochester, Minn., read a paper on "Effect of Certain General Anesthetic Agents on the Small Vessels of the Rabbit's Ear." Discussed by Drs. Eliot R. Clark, Philadelphia; Edgar V. Allen, Rochester, Minn.; Dennis E. Jackson, Cincinnati, and Thomas H. Seldon, Rochester, Minn.

On motion made by Dr. Ansel M. Caine, New Orleans, and seconded by Dr. Harvey C. Slocum, Madison, Wis., it was unanimously voted that in the absence of Dr. Eliot R. Clark, Philadelphia, his discussion be read by the secretary.

## MEDICAL LEGISLATION

### MEDICAL BILLS IN CONGRESS

*Changes in Status.*—H. R. 3864 has passed the House, proposing to amend the act providing for the registry of pursers and surgeons as staff officers of vessels of the United States by creating a medical division in the staff department to be under the charge of the senior registered surgeon on the vessel. H. R. 4476, a bill providing for sundry matters relating to the military establishment and including a provision authorizing the employment of osteopaths as interns in the Army, came up for consideration on the calendar of the House, June 16, but action on the bill was prevented on objection by Representative Cole of New York.

*Bills Introduced.*—H. R. 4888, introduced by Representative Green, Florida, authorizes the Administrator of Veterans' Affairs, within the limits of Veterans' Administration facilities, to furnish necessary dental care and treatment to veterans of any war who were not dishonorably discharged and who are not otherwise entitled to such dental services under any other law or veterans regulation. H. R. 4905, introduced by Representative Voorhis, California, undertakes to facilitate standardization and uniformity of procedure relating to the determination of service connection of injuries or diseases alleged to have been incurred in or aggravated by active service in a war, campaign or expedition. H. R. 4906, introduced by Representative Rogers, Massachusetts, proposes to authorize an appropriation of \$25,000,000 to establish a Women's Army Auxiliary Corps for noncombatant service with the Army, to make available to the national defense the knowledge, skill and special training of

the women of the nation. H. R. 4286, introduced by Representative Sabath, Illinois, proposes to amend the sections of the Social Security Act providing aid for the blind so as to eliminate the requirement that a blind person must be needy before he is entitled to benefits. H. R. 4853, introduced by Representative Rankin, Mississippi, proposes to authorize the hospitalization of retired officers and enlisted men who are war veterans on parity with other war veterans.

### DISTRICT OF COLUMBIA

*Bills Introduced.*—S. 1443, introduced by Senator Reynolds, North Carolina, proposes to authorize the Federal Security Administrator to accept gifts for St. Elizabeths Hospital and to provide for the administration of such gifts. H. R. 4837, introduced by Representative Randolph, West Virginia, provides that it shall be unlawful, except for purposes directly connected with the administration of old age assistance, aid to the blind, aid to dependent children, home care and general public assistance, and in accordance with rules and regulations prescribed by the Board of Public Welfare of the District of Columbia, for any person or persons to solicit, disclose, receive, make use of, or to authorize, knowingly permit, participate in, or acquiesce in the use of, any list of names of, or any information concerning persons applying for or receiving such assistance, directly or indirectly derived from the records, papers, files, or communications of the Board of Public Welfare of the District of Columbia, or acquired in the course of performance of official duties.

## MEDICAL ECONOMIC ABSTRACTS

## CASH DISABILITY INSURANCE

*A Statement by the Bureau of Medical Economics*

At the special session of the House of Delegates, Sept. 16 and 17, 1938, called to consider a proposed National Health Program, the recommendation on insurance against loss of wages during sickness received the following endorsement:

In essence, the recommendation deals with compensation of loss of wages during sickness. Your committee unreservedly endorses this principle, as it has distinct influence toward recovery and tends to reduce permanent disability. It is, however, in the interest of good medical care that the attending physician be relieved of the duty of certification of illness and recovery, which function should be performed by a qualified medical employee of the disbursing agency.

This form of cash compensation during disability is now attracting general interest. The New Hampshire legislature in 1939 passed "an act establishing a commission for the purpose of studying the possibilities of protecting individuals unemployed because of sickness or ill health." This commission has just reported in favor of the enactment of legislation for this purpose.<sup>1</sup> The commission made a study of the frequency of disabling illness among New Hampshire workers and found that there were 112 cases of such disability per thousand employees. This is a somewhat lower rate than has been found under most of the compulsory sickness insurance schemes of Europe. The average period of incapacity was found to be five calendar weeks. There was a considerably higher rate of disability in the low income classes as compared with those receiving over \$1,500 a year. It was found that not over 29 per cent of the employees are at present covered by any form of disability insurance. In 1939 the companies doing an accident and health insurance business in the state received \$583,243.43 as premiums and paid losses amounting to \$299,335.72. While it was recognized that there are some difficulties in certification of incapacity for work by a private physician, it was thought that "Administrative machinery can be devised to provide checks on malingering which admittedly is possible under the family

physician plan." The plan proposed a tax of 1 per cent on earnings, which it was believed would be more than adequate to provide benefits of one half of average earnings during the previous year for sixteen weeks of disability, after one week's waiting period, in any one year. It was proposed that the plan be administered by the workmen's compensation authorities. Since only sixteen weeks of disability would be paid for, the plan would make no provision for permanent disability. This recommendation was based on the thought that "Insurance against invalidity or permanent disability is partially provided in the Federal Old Age and Survivors' Insurance Program."

The Social Security Board is investigating social insurance for permanently disabled workers.<sup>2</sup> The board evidently disagrees with the New Hampshire commission and believes that permanent disability at least should be handled in connection with old age benefits. The discussion by the chairman, Mr. A. J. Altmeyer, recognizes the difficulty of avoiding duplications with compensation benefits. He proposes that the disability to be insured is not to be confined to industrial injuries and diseases. At the present time the person who is unemployed because of illness not only receives no benefit from unemployment insurance but, because of his inability to earn wages while disabled, may lose his privilege of receiving unemployment compensation should he return to work. It is suggested that, "after the introduction of disability insurance, periods of certified disability during which the worker is in receipt of disability benefits can be readily entered on the wage record of the worker, and his eligibility for old age and survivors benefits can be determined by omission of these periods. Thus, in effect, the insurance rights of the worker would be maintained during periods of certified disability." It is proposed that such disability insurance be accompanied by provisions for rehabilitation, and attention is called to the rehabilitation program in West Virginia which was originated by the West Virginia State Medical Association.

1. Commission on Disability Benefits, Report to His Excellency Robert O. Blood, Governor of New Hampshire, Concord, N. H., Concord Press, 1941.

2. Altmeyer, A. J.: Social Insurance for Permanently Disabled Workers, Social Security Bulletin 4:3, number 3, Washington, D. C., Social Security Board, Federal Security Agency, March 1941.

## WOMAN'S AUXILIARY

## California

The auxiliary to the San Francisco County Medical Society held a benefit bridge party on May 16 at the home of the county medical society, the proceeds of which will go to a scholarship fund to aid senior medical students at Stanford and California medical schools. Mrs. Eugene Kilgore, the new president of the auxiliary, assisted by a committee, was in charge of the benefit.

The Monterey group held a benefit bridge recently at the Hotel Del Monte. Three hundred members and guests attended, and the proceeds will be used to purchase equipment for the children's ward at the El Sausal Sanitarium in Salinas. The San Diego auxiliary helped plan the Symposium on Military Medical Preparedness, held in February. The meeting was sponsored by the California Medical Association in conjunction with the local society and the army, navy and marine corps.

## Delaware

The Woman's Auxiliary to the Medical Society of Delaware held an open meeting, February 11, in Wilmington with one hundred guests present. Dr. John A. Kolmer, of Temple University School of Medicine, Philadelphia, talked on social diseases. Mrs. V. E. Holcombe, president of the Woman's Auxiliary to the American Medical Association, and Dr. Raymond A. Lynch, chairman, advisory board of the Medical Society of Delaware, were guests.

## Idaho

The Ada County auxiliary held its January meeting at the homes of Mrs. Harmon Tremaine and Mrs. R. R. Jones in Boise. A lively discussion of pending legislation was held.

Arrangements were made to aid charitable institutions in Boise and Nampa. While their husbands were attending a meeting of the Southwest Medical Society in Boise the wives attended a "no host" dinner in the same hotel. Mrs. A. B. Boeck, president, Ada County division of the woman's auxiliary, presided. Mrs. Harmon Tremaine, president of the state auxiliary, spoke. Dr. James Hollingsworth spoke on his experiences in Czechoslovakia while he was a student. Members attended from Boise, Payette, Nampa, Mcridian, Mountain Home and St. Maries.

As a special project this year the Canyon County auxiliary has placed *Hygieia* in all schools. A series of talks has been given on articles taken from medical books of over a hundred years ago. Mrs. V. C. Belknap is president of the group and Mrs. E. D. Hunsaker is secretary.

## New Jersey

The Woman's Auxiliary to the Bergen County Medical Society met at Englewood Hospital, with Mrs. Raynold Berke presiding. Mrs. G. E. Timberman, of Tidgewood, was the speaker; she spoke on flower arrangements. The auxiliary voted to contribute \$25 to the American Red Cross. The auxiliary sponsored a buffet supper and dance, recently, in Englewood; the proceeds went into the philanthropic fund.

The Essex County auxiliary met recently in the Academy of Medicine with Mrs. J. Irving Fort presiding. William D. Palmer, of the Milk Inspection Association, spoke on the grading of milk. Mrs. Rox Wright, chairman of the Shelter Workroom, described the work it is doing in rehabilitating crippled girls. Mrs. George Scheller, widows' and orphans' chairman, reported that the society is contributing about \$1,000 at Christmas time among doctors' widows.



## Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

### CALIFORNIA

**Plague Infection.**—*Public Health Reports* notes that plague infection has been proved by animal inoculation in a ground squirrel, *Citellus beecheyi*, submitted to the laboratory April 21 from a ranch 7 miles south and 5 miles west of Tehachapi, Kern County. Plague infection has been proved, by animal inoculation and cultures, in organs from two rats, *Rattus norvegicus*, taken from a garbage dump at the foot of Gertrude Avenue, Richmond, Contra Costa County, submitted to the laboratory of the state department of health on April 28, it is reported.

**Residencies Available.**—Residencies in the specialties are available to qualified medical graduates at the Los Angeles County General Hospital and will be filled from an eligible list to be established on the basis of an unassembled open competitive civil service examination. Application to take the examination must be filed with the Los Angeles County Civil Service Commission by July 18. Candidates must have been graduated with a degree of M.D. from an approved medical school within six years prior to Jan. 1, 1941 and have completed at least a one year internship in an approved hospital. A residency or second year of internship or postgraduate work in an approved medical school of graduate instruction is desirable. The length of service is from one to three years. Uniforms and medical care will be provided and, in addition, \$50 a month will be paid for the first year and \$115 a month for the second and third years with the exception of the specialty of anesthesiology, for which the salary is \$115 for each of the three years. Other specialties named are dermatology and syphilology, general medicine, neurologic medicine, neurosurgery, orthopedic surgery and pediatrics. Application blanks and additional information concerning the examination can be obtained from the office of the Los Angeles County Civil Service Commission, Room 102, County Hall of Records, Los Angeles.

### DISTRICT OF COLUMBIA

**President of Society Called to Army Service.**—Dr. Daniel L. Borden, president of the Medical Society of the District of Columbia, has received orders from the War Department calling him to active service as lieutenant colonel in the medical corps. He will become chief surgeon of the new thousand bed hospital at Fort Meade, Md. Dr. Borden's term as president of the medical society will end on June 30 and he will report for service at Fort Meade the next day. In the first World War Dr. Borden served overseas as chief surgeon of Evacuation Hospital 18.

### GEORGIA

**Society News.**—The Fulton County Medical Society was addressed, May 19, by Drs. Gordon G. Allison on "The Six Venereal Diseases" and George F. Eubanks, "Carcinoma of the Left Colon." A special report of the appendicitis committee of the state medical association was presented before the society on May 5 by Dr. Fred F. Rudder. Other speakers were Drs. Jefferson L. Richardson on "Tachycardia" and Rudolph A. Bartholomew, "Interpretation of Blood Pressure Behavior During Pregnancy and Puerperium." All are from Atlanta.

**Personal.**—Evangeline Papageorge, Ph.D., assistant professor of biochemistry, Emory University School of Medicine, Atlanta, has been awarded the Sterling fellowship in biochemistry at Yale University, New Haven.—Dr. Warren A. Coleman, Eastman, has been appointed lieutenant colonel on the staff of Governor Eugene Talmadge.—Dr. Edgar H. Greene, Atlanta, has been appointed state selective service medical officer.—Dr. Walker L. Curtis, College Park, has been appointed medical examiner of the Civil Aeronautics Administration, succeeding the late Dr. David D. Moncrief, Atlanta.

### ILLINOIS

**First Aid Following Injuries on the Highway.**—The educational committee of the state medical society has prepared a series of twenty-five articles on first aid for use in the Illinois newspapers as part of an educational campaign on first aid following injuries on the highway. The plan has received the approval of the department of public works and buildings, division of highways. The first article in the series is entitled "Leave 'Em Where They Lie" and concludes with the suggestion that persons wishing additional information should write to the newspaper in which the article appeared.

**Drive on Tuberculosis.**—Three regional conferences in central and southern Illinois were held May 13 and 14 to launch an intensive drive against tuberculosis in the state, according to a statement from the state department of health, May 2. Dr. Jay Arthur Myers, professor of internal medicine, preventive medicine and public health, University of Minnesota Medical School, Minneapolis, discussed tuberculosis control measures in Minnesota that made it possible to close some of the sanatoriums there. The state department of health decided on the campaign after a study showing more cases and deaths from the disease in Illinois in 1940 than in 1939. It was pointed out that the number of new cases of tuberculosis in the state outside Chicago dropped from 3,257 in 1939 to 2,801 in 1940, but that the number of downstate tuberculosis deaths increased by 52, giving a total for 1940 of 1,741. In a news release Dr. Roland R. Cross, Springfield, director of health of Illinois, said that "communicable disease experts have found that for every death from tuberculosis there are usually about 10 active cases left among the living."

### Chicago

**School for Crippled Children to Be Expanded.**—Newspapers announced April 24 that construction was to begin on a \$700,000 addition to the Spalding School for Crippled Children. The two story brick addition will double the size of the school and give space for a complete educational unit from kindergarten through high school. Rooms will be provided for hydrotherapy, electrotherapy and physical therapy, ultraviolet ray, spastic and cardiac cases, deaf-oral and sight-saving cases, and dental work. The addition will also contain assembly hall, gymnasium, library, music room, lunchroom, roof solarium and play space.

**Dr. Hoffman Named State Alienist.**—Dr. Harry R. Hoffman, associate clinical professor of neurology, Rush Medical College, has been appointed state alienist to succeed the late Dr. H. Douglas Singer. Dr. Hoffman's position as director of the Cook County Behavior Clinic will be filled by Dr. William H. Haines as acting director, newspapers reported. Dr. Haines had served eighteen months as Dr. Hoffman's assistant. Dr. Hoffman graduated at Rush Medical College in 1910. Dr. Vladimir G. Urse was named on June 2 to succeed Dr. Francis J. Gerty as medical director of the Cook County Psychopathic Hospital when the latter resigned to become professor and head of the department of psychiatry at the University of Illinois College of Medicine.

**Koessler Fellowship.**—The Jessie Horton Koessler Fellowship of the Institute of Medicine of Chicago for the aid of research in biochemistry, physiology, bacteriology or pathology will be available on September 1. The stipend is \$500 a year with the possibility of renewal for one or two years. To be considered, applications must be approved by the head of a department in the fields mentioned or by the director of a research institute or laboratory in Chicago. Such approval must stipulate that the recipient of the fellowship shall be given adequate facilities for carrying out the proposed research, concerning which full information is required in the application. Applications, which will be received to July 1, should be made by letter and addressed to Dr. Harry Gideon Wells, 950 East Fifty-Ninth Street, chairman of the committee on the Jessie Horton Koessler Fund.

### IOWA

**Tuberculosis Program in Rural Schools.**—The Polk County Medical Society has approved a long range tuberculosis program in the five rural schools in the county. Under the new setup all school children, at the request of parents, will be examined for tuberculosis and an active epidemiologic follow-up will be made among all positive reactors, with emphasis on the younger age groups, in which there is greater likelihood of familial origin. An earlier case finding program was limited to high school children, but the new plan was instituted in the Runnels, Urbandale, Altoona, Grimes and

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Johnston schools. If a pupil is found to be a reactor, the family physician is furnished with a report and the child is urged to consult him. Nursing follow-up is available through the county health unit. If a roentgenogram is desired, arrangements are to be made on a private basis unless the family is unable to pay. Provisions and facilities are available for roentgen ray service on a free or part pay basis on request to the Polk County Tuberculosis Association. The program, which includes the education of teachers, students and parents relative to tuberculosis, is to be extended to the remaining rural schools in the next three years. The county tuberculosis association and Dr. Marvin F. Haygood, Des Moines, acting director of the county health unit, are cooperating in the project.

## MISSISSIPPI

**State Medical Election.**—Dr. Hubert L. Rush, Meridian, was named president-elect of the Mississippi State Medical Association at its annual meeting in Biloxi, May 16, and Dr. Augustus Street, Vicksburg, was inducted into the presidency. New vice presidents are Drs. Braxton B. O'Mara, Biloxi, Hiram C. Sheffield, Jackson, and Theodore H. Rayburn, Pontotoc. Jackson was selected as the place for the meeting in 1942.

## MISSOURI

**University News.**—The library at Washington University School of Medicine, St. Louis, recently received thirty-one volumes, principally on neurology and psychiatry, the gift of Dr. Samuel Treat Armstrong, Katonah, N. Y., class of 1879 of the St. Louis Medical College.

**The Sixth Loeb Lecture.**—Dr. George W. Corner, Baltimore, director of the department of embryology of Carnegie Institution of Washington, delivered the sixth Leo Loeb Lecture before the St. Louis Medical Society May 6. His subject was "The Ovarian Cycle." The lecture was established by the Mu chapter of the Phi Beta Pi medical fraternity in honor of Dr. Leo Loeb, professor emeritus of pathology and research professor of pathology at Washington University School of Medicine, St. Louis.

**Personal.**—Dr. Richard L. Sutton Jr., Kansas City, has been elected to membership in the Royal Society of Edinburgh. The society is composed of physicists, engineers, mathematicians, biologists and physicians. —James P. Baumberger, Sc.D., professor of physiology, Stanford University School of Medicine, San Francisco, has been granted leave of absence to serve from April 1 to December 31 as visiting professor in cytology at Washington University School of Medicine and research associate in the Barnard Free Skin and Cancer Hospital, St. Louis.

## NEW YORK

**Gastroenteritis Traced to Pastries.**—Twenty-one cases of gastroenteritis in Erie and Chautauqua counties were recently traced to custard-filled pastries from a bakery in Chautauqua County. Inspection of the bakery showed it to be modern, clean and generally sanitary. Laboratory investigation revealed *Staphylococcus aureus* in a culture taken from one baker who had complained of sinus disease. This man had assisted in preparing the custard mixture for the pastries. Another baker had a boil on his cheek and a carbuncle on his neck. This man said he had not assisted in preparation of the custard but had helped in carrying it from a vat to a table.

**Society News.**—Dr. Frederick L. Patry, Albany, addressed the Greene County Medical Society at Catskill, May 13, on "Psychiatric and Neurologic Examination Facts and Deductions After Processing 10,000 Selectees." —Drs. Donato Anthony D'Esopo, New York, and Karl W. Gruppe, Utica, addressed the Utica Academy of Medicine, May 15, on "The Occipitoposterior Position—Its Mechanism and Treatment" and "Bronchoscopy in Diagnosis" respectively. —Dr. George T. Pack, New York, addressed the Medical Society of the County of Albany, May 28, in Albany on "Cancer of the Stomach." —Dr. Clement E. Schotland, Newark, N. J., gave an address on "Pseudohypertrophic Muscular Dystrophy" before the society, May 14. —Dr. George G. Smith, Boston, addressed the Onondaga County Medical Society, May 6, on "Genitourinary Problems of the General Practitioner." —Lieut. Col. Charles L. Maxwell, M. C., U. S. Army, Mitchell Field, L. I., addressed the Medical Society of the County of Nassau in Garden City, May 27, on "Medical Aspects of Air Raid Casualties and Air Raid Precautions." —Dr. Benjamin P. Watson, New York, addressed the Medical Society of the County of Westchester, Rye, June 14, on "Medical Controversies of Yesterday and Today—A Contrast."

## New York City

**Roosevelt Hospital Addition.**—Dr. Willard C. Rappleye, commissioner of hospitals, laid the cornerstone, May 21, for a new addition to Roosevelt Hospital to replace a building recently demolished. The new wing will be five stories high and will cost \$1,000,000.

**Residency in Pathology.**—The Israel Zion Hospital announces that a residency in pathology is available there to physicians who have had a one year general internship in an approved hospital. For further information applicants may write to the Superintendent, Israel Zion Hospital, Tenth Avenue, Forty-Eighth to Forty-Ninth streets, Brooklyn.

**Society News.**—Drs. Walter E. Dandy, Baltimore, and Paul Klemperer addressed the Medical Society of the County of Kings, May 20, on "Diagnosis and Treatment of Lesions of the Cranial Nerves" and "The Essential Systemic Nature of Acute Lupus Erythematosus and Other Generalized Diseases of the Skin" respectively. —Drs. Samuel A. Thompson and James S. Edlin addressed the Brooklyn Thoracic Society, May 16, on "Bronchial Catheterization and Bronchography" and "Artificial Pneumothorax in the Treatment of Pulmonary Tuberculosis" respectively.

**Faculty Changes at Columbia.**—The following appointments and promotions at Columbia University College of Physicians and Surgeons were announced recently, according to *New York Medical Week*.

Dr. John H. Garlock, appointed clinical professor of surgery, Georgia School of Medicine, Augusta, associate professor of anatomy.

Howard J. Curtis, Ph.D., instructor in physiology, Johns Hopkins University School of Medicine, Baltimore, to be assistant professor of physiology.

Dr. Maurice Lenz, to be professor of clinical radiology.

Dr. Alexander Ashley Weech, to be professor of pediatrics.

Dr. John M. Hansford, to be associate professor of clinical surgery.

Drs. Arthur M. Master, Helen Gavin and Frederick R. Bailey, promoted to be assistant clinical professors of medicine.

Dr. Joseph H. Holmes, promoted to be assistant professor of pathology.

Dr. Ludwig von Sallman, promoted to be assistant professor of ophthalmology.

Dr. Louis Hirschhorn, promoted to be assistant professor of pharmacology.

**Graduate Fortnight.**—The annual Graduate Fortnight of the New York Academy of Medicine will be held October 13-24 with "Cardiovascular Diseases Including Hypertension" as the subject. The program will include morning panel discussions, afternoon clinics and clinical demonstrations at hospitals, evening addresses and a scientific exhibit. Speakers at the evening sessions will be Drs. Carl J. Wiggers and Harry Goldblatt, Cleveland; Paul D. White, Timothy Leary, Edward D. Churchill, James C. White, Thomas Duckett Jones and Soma Weiss, Boston; George M. Piersol and Isaac Starr, Philadelphia; Harold M. Marvin, New Haven, Conn.; Donald W. Gordon Murray, Toronto, Ont.; Edgar V. Allen, Rochester, Minn.; Newell C. Gilbert, Chicago; Tinsley R. Harrison, Nashville, Tenn.; Edwin P. Maynard Jr., Brooklyn; Robert L. Levy, Emanuel Libman, Bernard S. Oppenheimer, Robert C. DeGraff, Gerald H. Pratt, Irving S. Wright, Harold E. B. Pardee and Alfred E. Cohn and Magnus I. Gregersen, Ph.D., New York.

## PENNSYLVANIA

**District Meeting.**—The Ninth Councilor District of the Medical Society of the State of Pennsylvania held its annual meeting at Punxsutawney, June 26, with the following scientific program: Drs. Julius M. Rogoff, Pittsburgh, "Endocrine Aspects of Hypertension"; Ralph Lynch, Pittsburgh, "Prothrombin and Vitamin K in the Jaundiced Patient"; John P. J. McCague, Pittsburgh, "Genitourinary Disease"; Edward Griffith, Pittsburgh, "Cholecystitis," and Sergius V. Algin, Indiana, "Discussion of Vitamins." Dr. Francis F. Borzell, Philadelphia, president of the state society, discussed "Medical Preparedness."

## Philadelphia

**Medical Supplement.**—The Philadelphia Record published a sixteen page medical supplement, May 6, with the cooperation of the Philadelphia County Medical Society public relations committee. All the reading matter was prepared by medical authorities selected by this committee, which also passed on all advertisements.

**Professor to Retire.**—Dr. Henry Field Smyth, assistant professor of industrial hygiene, University of Pennsylvania School of Medicine, is retiring at the end of the present academic year. Dr. Smyth took his medical degree at the uni-

# MEDICAL NEWS

## GENERAL

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versity in 1897 and has been associated with the faculty in various capacities since 1912. He has held his present title since 1921 and in addition has served as director pro tem of the laboratory of hygiene since 1932.

### Pittsburgh

**Society News.**—Dr. Murray M. Copeland, Baltimore, addressed the Pittsburgh Roentgen Society, May 10, on "Prognosis of Bone Tumors."—Dr. Samuel R. Haythorn, among others, addressed the Pittsburgh Academy of Medicine, May 13, on "Bituminosis and Antirraeosilicosis in Relation to Tuberculosis."

**Annual Clinic.**—The Pittsburgh Skin and Cancer Foundation presented its ninth annual clinical demonstration, May 15. Among the subjects demonstrated were roentgen ray burns, lymphatic gland tumors, skin diseases amenable to the sulfonamide group of drugs, aene vulgaris, the avitaminoses, and carcinoma of the breast and of the larynx, esophagus and tracheobronchial tree.

### TEXAS

**Physicians Honored.**—Drs. Sidney M. Lister and J. Edward Hodges, two of the founders of Jefferson Davis Hospital, Houston, were honored at a dinner recently on their retirement from the active staff of the hospital. Dr. Lister graduated from Barnes Medical College, St. Louis, in 1898 and moved to Houston several years later. He has served on the state board of health and the state prison board. Dr. Hodges graduated from the University of Texas School of Medicine, Galveston, in 1897 and the University of Pennsylvania School of Medicine in 1898. Both men have been president of the Harris County Medical Society and both have served as chief of staff of Jefferson Davis Hospital. Dr. Theodore R. Hanon, now chief of staff, presented silver keys to the retiring staff members in token of their long service.

### WASHINGTON

**Crime Detection Laboratory.**—The Tacoma General Hospital has established a crime detection laboratory, according to *Northwest Medicine*. Dr. Charles P. Larson, pathologist and director of laboratories at the hospital, will be in charge. The services of the laboratory will be available to all law enforcement agencies in the state.

**Obstetric Meeting.**—The spring meeting of the Washington State Obstetrical Association was held recently in Seattle, with Dr. Ludwig A. Emge, San Francisco, as guest speaker. Dr. Emge spoke on "Basic Principles of Estrogenic Therapy" and "Placental Accidents and Their Treatment." Dr. Richard S. Mitchell, Wenatchee, was elected president, Dr. John F. Fiorino, Everett, vice president and Dr. Henry H. Skinner, Yakima, secretary.

### WISCONSIN

**Personal.**—Dr. Glenn V. Hough, formerly of Milwaukee, has been appointed health officer of the fourth public health district with headquarters at Sparta. He succeeds Dr. Edwin H. Jorris, who has been appointed director of local health services for the state board of health.—Dr. Arthur R. Zintek, Durand, has been appointed health officer of the first district with headquarters in Madison to succeed the late Dr. Guy W. Henika.

**District Meetings.**—The Sixth and Eighth Councilor District medical societies held a joint meeting in Appleton, May 27, with the following speakers: Drs. William S. Middleton, Madison, "Bronchiogenic Carcinoma"; Philip Lewin, Rochester, "The Foot and Ankle"; Stuart W. Harrington, Rochester, "Carcinoma of the Breast," and Walter C. Alvarez, Minn., "Puzzling Types of Indigestion."—Drs. William S. Middleton, Rochester, "Food Allergy."—Drs. William S. Middleton, Rochester, and James C. Sargent, Milwaukee, spoke in the evening on the Seventh Councilor District meeting of the annual meeting of the Seventh Councilor District Medical Society in La Crosse, May 13, on "Shock" and "Common Injuries Involving the Urinary Tract" respectively.—The annual meeting of the Ninth Councilor District Medical Society was held at Stevens Point, May 15, with the following guest speakers: Drs. Edgar S. Gordon, Madison, on "Nutritional Deficiencies"; Theodore L. Squier, Milwaukee, "Endocrine Deficiencies"; Elmer L. Sevringhaus, Madison, "Endocrine Deficiencies"; and Charles J. Newcomb, Milwaukee, on "Forcible Delivery"; Ira R. Sisk, Madison, "Chemotherapy in Urinary Tract Infection," and Louis A. Brunsting, Rochester, Minn., "Treatment of Common Skin Disorders."

**International College of Surgeons.**—The fifth international assembly of the International College of Surgeons will be held in Mexico City, August 10-14, at the invitation of the Mexican government. Surgeons in the United States desiring information about presentation of papers or scientific exhibits are requested to query Dr. Desiderio Roman, chairman of the scientific committee, 250 South Seventeenth Street, Philadelphia. Those seeking travel information may communicate with Dr. Max Thorek, international executive secretary, 850 West Irving Park Boulevard, Chicago. Dr. Fred H. Albee, New York and Venice, Fla., is international president and Dr. Frederick M. Douglass, Toledo, Ohio, is president of the United States chapter of the college.

**Plan Second Congress on Obstetrics and Gynecology.**—The American Committee on Maternal Welfare announces that the second American Congress on Obstetrics and Gynecology will be held in St. Louis, April 6-10, 1942. Headquarters will be at the Jefferson Hotel and the meeting and exhibits at the Public Auditorium. The general plan of the congress will be much the same as that of the first congress in Cleveland in 1939, with general and sectional meetings and round tables for members and evening sessions open to the public. Membership cards may be obtained by payment of the \$5 registration fee any time after September 1. Dr. Fred L. Adair, Chicago, is chairman of the executive committee and Dr. Everett D. Plass, Iowa City, of the program committee. Further information may be obtained from the Chicago office of the congress, 650 Rush Street.

**Blindness Prevention.**—The National Society for the Prevention of Blindness in its annual report for 1940 emphasized the increase in eye hazards brought about by expansion of industrial production made necessary by national defense plans. The society has appointed an industrial advisory committee representing industrial plants, state and federal departments of labor, the U. S. Chamber of Commerce and the American Association of Industrial Physicians and Surgeons. Many firms are using the new industrial talking slide film "The Eyes Have It," made available to the society without cost by the Pullman Company. The society is now planning an evaluation of vision testing procedures used with school children and preschool children in the hope of establishing a uniform procedure. During 1940 the National League for Nursing Education began a study of nursing education in sight conservation in cooperation with the society. The society has also arranged to cooperate with similar organizations in Latin America, has prepared an exhibit on glaucoma and has carried on its campaign to reduce blindness caused by venereal disease and by fireworks. The expenditures of the year amounted to \$159,808 and the income was \$142,062.

### CANADA

**Health Conservation Winners.**—Rural health units that won the 1940 Canadian Health Conservation Contest were in the Eastern division, Terrebonne County Health Unit, St. Jerome, Que., and St. Jean-Iberville-Laprairie-Napierville Health Unit, St. Jean, Que., and, in the Western division, Peace River Health Unit, Pouce Coupe, B. C., and St. James-St. Vital Health Unit, Manitoba. In the group of cities of more than 100,000 population with full time services Windsor and Hamilton, Ont., were placed on the honor roll; in the group under 100,000 with a full time medical officer, Saint John, N. B., and London, Ont., were the winners and among cities under 100,000 with part time medical officers St. Catharines, Ont., was honored. The rural contest is financed by the W. K. Kellogg Foundation of Battle Creek, Mich., and the city contest by the Metropolitan Life Insurance Company of New York.

### CORRECTIONS

**Misstatement in Percentage of Syphilis.**—The JOURNAL, June 14, page 2703, under Indiana news, reported that in the United States Army selective service group from Indiana 33,017 serologic tests were made and 321, or 3.8 per cent, showed positive reactions. The percentage should be recorded as 0.97.

**Kinney's Yeast Extract.**—Correction is made of an error in the description of Kinney's Yeast Extract (Vitamin B Complex) Tablets, 5 grains, appearing in THE JOURNAL, June 14, page 2683. In the published description it is stated that "Each tablet contains not more than 50 international units of thiamine hydrochloride." This should read "Each tablet contains not less than 50 U. S. P. units of thiamine hydrochloride."

## Government Services

### Annual Report on Health of the Army

Loss of time in the U. S. Army during the calendar year 1939 was the lowest for over twenty years, with a noneffective rate of 26.6 per thousand of army strength, according to the report of the surgeon general for the fiscal year ended June 30, 1940.

The strength of the army in 1939 was 191,551. Toward the end of the year inactive units were activated, new units were established and the Puerto Rican Department was set up.

Gonorrhea caused the greatest loss of time, with 175,055 days. Athletic exercises were second with 82,250 days lost, then acute nasopharyngitis with 72,921 days lost, motor vehicle accidents 67,028, tuberculosis 65,126, accidental falls 60,560, appendicitis 59,727, syphilis 46,384, hernia 45,000, bronchitis 39,359, trichophytosis 35,192 and chronic tonsillitis 32,918.

Army hospitals carried an average daily load of 10,124 patients, 4,753 of whom were military personnel. Absence from duty because of illness amounted to 2.68 per cent of the strength of the army, a reduction from the 1938 figure of 2.80. Military personnel treated on an outpatient or dispensary basis amounted to 2,611, or 1.36 per cent of the average daily strength.

The number of admissions to sick report was 101,362. Acute nasopharyngitis was the leading cause of admission to sick report as it has been for several years.

There were 584 deaths in the army in 1939, of which 296 were caused by diseases and 288 by injuries. For the sixth year motor vehicle accidents were the leading cause of death, with 97 fatalities. Other important causes were suicides 56, diseases of the coronary arteries 47, air transport accidents 36, homicides 18 and appendicitis 17.

Discharges for disability reduced the strength of the army by 1.11 per cent; 150 of those discharged were officers, 19 nurses and 1,962 enlisted men. Among enlisted men 48 per cent of the discharges for disability occurred within the first year of service, the report showed. With few exceptions the causes of these disabilities existed prior to enlistment, it was pointed out.

The chief causes of disability were schizophrenia, tuberculosis, psychoneurosis, ulcer of the duodenum, pes planus, epilepsy and arthritis.

The admission rate of venereal disease, 29.6, was lower than in 1938. The highest incidence occurred in Puerto Rico, where white enlisted men were stationed for the first time. Twenty-two per cent of the cases were of syphilis and 68 per cent of gonorrhea.

The incidence of influenza was twice as high as in the previous year, the greatest prevalence being in Panama. The fatality rate for pneumonia was higher in 1939, 5.3 per cent as compared with 3.9 in 1938; sulfapyridine and sulfathiazole were not used extensively in treatment until the latter part of the year.

The placing of white troops in Puerto Rico, where malaria is endemic, led to an extremely high admission rate in that department, 253.4 per thousand of strength. The general rate for the army was 5.2.

Seven cases of typhoid were reported. In none of the cases was the source of the infection determined, and no two were related. There were 81 cases of cancer with 36 deaths as compared to 76 cases with 30 deaths in 1938. Diseases of the nervous system remained about the same in incidence as for the past few years, causing 36 per cent of the discharges for disability. The highest rate occurred in the Philippines.

The admission rate for 1939 for injuries was the lowest since 1923. Fractures required 188,052 days of treatment, more than any disease or any other type of injury.

The number of surgical operations performed in 1939 was 24,554. Most frequent were tonsillectomies 3,461, reduction of fractures 2,772, appendectomies 1,918 and herniotomies 802.

Thirty-two officers and 639 enlisted men were invalided home from overseas garrisons. The largest number, 162, or 22.8 per cent, were brought home because of psychoses and psychoneuroses.

From December 1939 to the end of the fiscal year the following medical units had been organized: two medical regiments, one new; six new medical battalions; one provisional

medical battalion; one medical squadron reorganized and augmented; one medical troop mechanized; one ambulance company and one veterinary company reorganized and medical detachments for the infantry, field artillery and engineer units in six infantry divisions.

At the time of this report there were 110 regular army flight surgeons assigned to air corps stations and, in addition, 18 reserve flight surgeons and 94 reserve medical officers who are not flight surgeons were on extended active duty with air corps units. The expansion of the army probably will require 537 additional medical officers for air corps stations alone.

Organization of reserve hospital units in affiliation with civil institutions is progressing.

One hundred and eighty-three regular army officers completed courses of instruction at the Army Medical School, the Army Dental School, the Army Veterinary School and the Medical Field Service School and twenty-seven at other service schools. In addition, 12,645 officers, enlisted men and civilian employees were enrolled in medical department extension courses and 2,946 in medical R. O. T. C. units.

The Army Medical Museum reported 102,997 visitors during the year. A notable accession was a tumor registry maintained for several years by Dr. Joseph McFarland, Philadelphia, containing several thousand cases, most of them followed to completion.

An appropriation has been made for plans for a new building for the museum and the Army Medical Library, though no funds for land or buildings have been provided. During the year the library added 5,134 volumes and 92 periodicals, about half the latter being Spanish-American journals.

### Improvement in Records of Federal Security Agency

A statement from Mr. John J. Corson, director of the Bureau of Old Age and Survivors Insurance in the Federal Security Agency, summarizes the present situation regarding the keeping of the records in that division:

Less than 0.6 of 1 per cent of all wages of employees covered by the old age and survivors insurance program reported by employers had not been posted to the individual employee's insurance account as of April 25, 1941. This small fraction of the total of over \$100,000,000,000 in wages reported by employers for their employees during the first four years' operations of this insurance system is made up principally of the earnings of casual and part time workers whose association with an employer was so brief that proper records were not established as a basis for the employer's subsequent tax reporting. A constant improvement in the accuracy and completeness of employers' reports has made possible the steady improvement of these recent records; whereas approximately 10 per cent of the employers' reports for employees were inaccurately or incompletely reported in 1937, less than 1.5 per cent were reported in this manner in 1940. Employee wage items which remained unposted to the proper individual's insurance account are reviewed daily as each claim is filed, with the consequent result that additional items are identified and credited at the time a worker or his survivor applies for his benefits.

### Dr. Bruce Mayne Is Dead

Bruce Mayne, Dr.P.H., identified with the U. S. Public Health Service in various capacities since 1908, died in the U. S. Marine Hospital, Baltimore, April 30, following an extended illness. Dr. Mayne was born in London, England, in 1882. He took his M.S. degree at the University of California in 1910. Later he received a certificate from the London School of Tropical Medicine and in 1925 the degree of doctor of public health from the University of Georgia. Specializing in medical entomology, Dr. Mayne had been field assistant in entomology at the University of California 1906-1907; technical assistant of the plague laboratory of the U. S. Public Health Service, 1908-1910; entomologist, Veterinary Corps, Bureau of Science, Philippine Islands, 1910-1914; biologist and later associate sanitarian and associate entomologist, U. S. Public Health Service, 1914-1926; malariologist, Malaria Survey of India for the Imperial Government of India, 1926-1929, and since 1930 special expert in malaria research, U. S. Public Health Service. He had lectured throughout the world from time to time under special auspices.

## Foreign Letters

### LONDON

(From Our Regular Correspondent)

April 19, 1941.

#### The Bombing of Hospitals

It has been well said that London's great hospitals are in the front line of the war. Blitz or no blitz, their staffs carry on. Each hospital, in addition to its normal work, has become a casualty clearing station. At 2:30 one morning a 2,000 pound bomb struck a block of St. Thomas's Hospital and crumpled three floors. Two nurses and four masseuses were crushed to death in the masonry. Electric light cables were severed, and the gas began to fail. More bombs rained down, and damage to the extent of over \$5,000,000 was done. Nurses with cuts and other injuries carried patients down to the basement, into which water flooded. Work is now carried on there by means of dim lights with chalk signs directing the way to wards, operating rooms, and dispensary and linen stores.

The rescue work performed by the staff after the hospital had been bombed has been recognized by the conferring by the king of three George medals—on Dr. H. R. B. Norman, resident assistant physician, Mr. P. Maling, medical student, and Mr. H. E. Frewer, assistant clerk of works. Two men were trapped and injured in a confusion of blazing mains, collapsing masonry and choking fumes when a bomb destroyed the dispensary stores and crashed into the basement. Mr. Frewer led the rescue party into this dangerous area. Dr. Norman, assisted by Mr. Maling, burrowed into the débris and gave injections of morphine to the injured men, whom they ultimately extricated. At present the hospital functions under the abandoned upper floors and débris. The former linen room has become one operating room, and a laundry has been converted into another. A blanket store has become the dispensary.

A 500 pound bomb fell on the St. George's Hospital, but the nurses carried on as if nothing had happened. St. Bartholomew's, founded in 1123, has lived through two great fires and now covers 8 acres. It has had its share of bombs and moved downstairs, where it carries on. Guy's Hospital is isolated in a sea of rubble. One ward has a 15 foot bomb crater in the mosaic pavement. This was screened off, and the ward carries on. "What do your patients do in a raid?" a sister was asked. "They stay put," she said. "The women do a little knitting and the men study the football pools!"

The London Chest Hospital was damaged so much that representatives of the Ministry of Health said that they had not seen anything greater in one night's raids. Nevertheless nine days afterward the Union Jack was hoisted to announce the reopening of the hospital for outpatients and special departments, including the blood donor section. The chapel and pathologic department were totally destroyed. The north wing was so damaged that it will have to be demolished and the upper portion of the south wing was gutted by fire. The main building is without windows and, with fallen ceilings and cracked beams, is usable only under conditions of great discomfort. But though there were 82 patients and 76 staff in the hospital at the time of the damage no lives were lost and no one was seriously injured. The pathologic laboratories and museum were reduced to a heap of rubble, burying many thousand dollars' worth of apparatus and irreplaceable records. Five nurses were trapped in the wrecked part, but on release they immediately assisted in the care and evacuation of patients.

Turning from London to the provinces, in the last air attack on Coventry a hospital was bombed and a physician, three sisters, two nurses and several patients were killed. When one of the bombs fell a nurse was sheltering beneath a bed with a patient. Both fell through the floor and had a lucky escape. The nurse immediately went to help other patients, though her

hands were bleeding and her clothes were torn to shreds. Other nurses were injured, but the matron said that within a few minutes all were carrying on their duties.

#### Renal Failure in Injuries of the Limbs

Attacks from the air on our civilian population have brought to light a new pathologic condition—renal failure after crushing of the limbs by fallen débris. Three papers on the subject have been contributed to the *British Medical Journal* (March 22, pp. 427, 432, 434). E. G. L. Bywaters and D. Beall, of Toronto, report from the British Postgraduate Medical School 4 cases, all fatal, of crush injury of the limbs, which, because of their similarity, seem to present a new syndrome. The patient has been buried for several hours with pressure on a limb. On admission to the hospital he looks well except for swelling of the limb, some local anesthesia and whealing. The hemoglobin, however, is raised, and a few hours later, despite vasoconstriction, shown by pallor, coldness and sweating, the blood pressure falls. This is restored by transfusions of serum, plasma or occasionally blood. Anxiety may now arise concerning the circulation of the injured limb, which may show diminution of arterial pulsation with signs of incipient gangrene. Signs of renal damage soon appear and progress, even though the crushed limb is amputated. The urine, initially scanty, perhaps from the shock, further diminishes and contains albumin and many dark brown or black granular casts. The patient is alternately drowsy and anxious. Slight generalized edema, thirst and incessant vomiting develop. The blood urea and potassium become progressively higher, and death occurs within a week.

A girl of 17 was buried for nine hours with heavy masonry lying across the left leg. On admission the leg was swollen and sensation was impaired at the ankle, where all movement was lost. Her skin was pallid and clammy. The blood pressure was 85 systolic and 70 diastolic. Transfusion of plasma, followed by dextrose-saline solution, was followed by a rise in blood pressure, and urine was passed containing no albumin. But next day the leg was cold below the knee, and amputation was performed. The urine contained albumin and hyaline and granular casts and what seemed to be red cell casts. During the next five days the urine became scanty, and intravenous and other infusions were given, but she suddenly collapsed and died. The necropsy showed the kidneys large, dark red and firm, with tense capsules due to swelling of the cortex. Microscopically the convoluted tubules and loops of Henle were found severely damaged. In the amputated leg the popliteal artery was surrounded by hemorrhage, which extended along the intermuscular fascial planes. Sections of the muscle, which macroscopically looked normal, showed some fibers undergoing necrosis.

In all 4 cases severe degenerative changes were found in the convoluted tubules and muscle necrosis of varying degree. So far 11 of 16 recorded cases were of this rapidly fatal type. In the other less severe cases recovery took place. In the present uncertainty as to the pathogenesis it is not possible to recommend any special treatment. Amputation does not appear to help the renal condition.

#### The Food Situation

The public has been warned that food supplies will be difficult for the next three months. This does not mean that people cannot be fully nourished but that they will be restricted with regard to certain foods, mainly animal. One way in which the government is meeting the difficulty is by education in the use of food. Advice centers have been established all over the country where food demonstrations and talks on nutrition are given. These have been attended by domestic science teachers, canteen managers and workers. An attempt has been made to wean the public from a tea and bun diet to the more extensive use of vegetable sandwiches and soups. Another move is the



establishment of communal feeding centers where nutritious food can be obtained at moderate prices. These have proved an unqualified success in bombed areas. Such methods mean greater economy in the use of food and thus are equivalent to an increase of supply.

### Centenary of the Pharmaceutical Society

The Pharmaceutical Society, which has celebrated the centenary of its foundation, has received the congratulations of medical societies, learned bodies and pharmaceutical societies in all parts of the empire and the United States. Sir John Anderson, who, as Lord President of the Council, represented the government, addressed the society. He reminded its members how, at the beginning of the previous great war, he was responsible for ensuring a continuous supply of all necessary drugs, which led to fruitful and useful collaboration among chemists, pharmacists and the government, with the result that, in spite of having relied on Germany before the war for so much of our supplies of drugs, we were able to get through without any noticeable shortage. The Therapeutic Substances Act sprang from the work done in that period, for, when we had succeeded in producing certain vital therapeutic substances, previously produced only in Germany, certain safeguards had to be taken in unloading them on a trusting public. The society sprang from an attempt of the medical profession to secure greater privileges at the expense of pharmacists, who might have easily slipped back to a body of privileged shopkeepers concerned solely with material interests. But its founders laid down that the main aim of the society should be to advance chemistry and pharmacy. It had maintained laboratories under highly competent chemists and stood in the van of progress.

Not the least remarkable work of the Pharmaceutical Society is the speed with which it established an educational system and thus raised the standard of the compounding and dispensing of prescriptions. The Poisons and Pharmacy Act, 1908, which controlled the sale of poisons, fundamentally changed the constitution of the society, for membership was made compulsory on all registered pharmacists. It also gave the society disciplinary control over pharmacists.

### BELGIUM

(From Our Regular Correspondent)

May 2, 1941.

#### Undernourishment a Pressing Problem

The food shortage, as reported to the Society of Physicians and Surgeons of Brabant by Dr. Ketelbant, is one of the pressing problems the effects of which are seen in children's digestive disorders accompanied by diarrhea. Gastroenteritis has been common of late in nurslings and colitis in children of medium age. Atypical vitamin deficiencies have appeared. Cutaneous suppuration, impetigo, furunculosis and many cases of pyodermitis could be traced to vitamin A deficiency in a nutrition which lacked fats of good quality. In addition, the absorption of fats is much more difficult during the course of diarrheal syndromes. Infections due to *Escherichia coli* and paratyphoid seem to break down the vitamin C content of the body. Atypical vitamin deficiencies have seemed to occur most frequently of late in colibacillary infections. Food deprived of essential amino acids cannot fail to affect growth and the organic balance. The milk needs likewise have not been provided for. Milk needs to be supplied until the end of the growing period. The child of 5 years requires 1,200 calories daily; that of 5 to 7, 1,440; 7 to 9, 1,680; 9 to 11, 1,900; 11 to 12, 2,160. The present rationing, however, allows for only 1,200 to 1,300 calories daily. Further nutritional complications have arisen from protein deficiencies. At 3 years the child requires 3 Gm. per kilogram of body weight and from 5 to 15 years old 25 Gm. This is more than the child obtains at present.

The nutritional needs of pregnant women were studied by de Guchteneere and presented in *Le Scalpel*. Professor Mالدague, he pointed out, had set the daily calory needs at 1,440 calories for the month of November 1940, amounting to 39 Gm. of proteins with 18.75 Gm. of fats and 275 Gm. of carbohydrates. The commission on diabetes of the College of Physicians of Brussels (Drs. J. Slosse, R. Verhoogen and R. Willocx) fixed them at 1,380 calories for the month of December 1940, namely 33 Gm. of proteins, 24 Gm. of fats and 252 Gm. of carbohydrates. Professor Hoet for the month of November 1940, taking account on the one hand, of the amount of food rationed to the populace (though often in quantities lower than the official figures, especially as far as potatoes and dry legumes were concerned) and, on the other hand, of the supplementary foodstuffs, moderate quantities of which could be still obtained apart from rationing restrictions, such as eggs, cheese, fish, legumes, fruit and skimmed milk, estimated a total of 1,138 calories (31 Gm. of proteins, 25 Gm. of fats, 202 Gm. of carbohydrates).

Since September 1940 pregnant women have received daily, from the fourth month on, an added ration of 750 cc. of milk and 112.5 Gm. of bread, which is equivalent to 697 calories. This meets in part the demands set up by the commission on nutrition of the College of Physicians formed in July 1940. In its report made to the ministry of public health in the same month, the commission had asked for 25 Gm. of butter (or fats rich in vitamins). The meat ration at that time amounted to 75 Gm. gross. This had been deemed insufficient. It then fell to 35 Gm., the present allowance. Altogether, pregnant women receive a daily ration fluctuating between 1,835 and 2,137 calories. Accordingly, deficiency of 800 daily calories exists in the nutrition of pregnant women, measured by an average 2,600 calories needs for pregnant women. However, for the last three months of pregnancy, the most important in fetal life, the deficiency rises to 1,200 calories daily. If these conditions persist it augurs ill for the future vitality of the Belgian race.

The first cases of deficiency edema were reported by Leon Dumont in *Le Scalpel*. They occurred in December 1940. The characteristics were a more or less developed anasarca condition, with a significant increase in the quantity of total water and a pronounced diminution of proteins in the serum. They healed spontaneously with rapidity as the result of rest and an ordinary well balanced diet.

#### Efforts to Unite the Belgian Medical Press

Moral disorder is the keynote at present of all attempts to create organization out of chaos, and the medical world has felt the repercussions. The efforts which have been made to unite the scattered forces of the medical press met with much cooperation and good will. Until a year ago an excessive number of medical journals was published. A few months ago the proposal was made to issue a single review combining the dispersed remnants. A Belgian review almost a century old volunteered to try this unification, with the assurance that the attempt would be abandoned if the undertaking was contrary to medical interests. The offer was not accepted. At present two medical periodicals have resumed publication, the *Archives Médicales Belges* and *Le Scalpel*. These are purely technical and scientific reviews. Besides these, the following journals of professional interest are appearing: *Le Médecin Belge*, organ of the Belgian medical federation, and *Mededeelingen*, organ of the Algemeen Vlaamsch Geneesheeren Verbond. These publications are bitterly opposed to each other. The first wishes to conserve the unity of the Belgian medical profession by maintaining friendly relations between the Walloon and the Flemish

physicians. The other demands the complete separation of Walloon and Flemish medical societies. The situation presents no outlook for reconciliation.

The organization of the Belgian medical profession likewise is undergoing profound changes. There is much talk at present of the fusion of the different political and professional mutual medical aid societies now existing into a single organization for the whole country. Into this single organization all those entitled to medical care belonging to the different official state departments as well as the war invalids of the wars of 1914-1918 and of 1940 could be merged. However, a cleavage already appears in that isolated groups, such as medical care claimants belonging to the country police and the railroads, are organizing separately, whereas the soldiers and their families have been integrated into the single organization. Military health service has been dissolved and the personnel either has been returned to civil life or is employed in certain medical or paramedical activities. Unfortunately, nothing constructive has been reared to take the place of what has been destroyed. In view of this situation, many government organizations (families of soldiers, employees, arsenal workers and their families) entitled to medical care can no longer lay claim to it. If this situation persists, it will cause havoc.

### BUENOS AIRES

(From Our Regular Correspondent)

April 30, 1941.

#### New Medical Journal

*Medicina* is a new medical journal published in Buenos Aires by a group of young physicians. The members of the editorial committee have carried on work on clinical medicine, physiology, biochemistry and pharmacology in Argentina and in foreign countries. The journal is promising for the information it contains on clinical and pathologic problems. Two issues have been published, each of which contains seven original articles, one article with clinical reports, four editorials and a general review of the literature.

#### Dr. Braun Mendez to Lecture at University of California

Drs. Houssay, Fasciolo and Taquini made investigations by which they proved in 1937 and 1938 that the ischemic kidney produces a vasoconstrictor substance which passes to the blood. The substance is easily identifiable in the venous blood of ischemic kidneys and does not exist in the venous blood of normal kidneys. Drs. Eduardo Braun Mendez, Fasciolo, Leloir and Muñoz carried on further work for confirmation of the previous results. In 1939 they identified a hypertensive substance from the venous blood of the ischemic kidney. They found that the kidney secretes a ferment, renine. Hypertensine is the product of fermentation of the pseudoglobulin fraction of the blood plasma by renine. Page described also the substance some time after it was described by Braun Mendez. He called it angiotonine. Dr. Braun Mendez and his collaborators have carried on careful researches on the pharmacologic effects of hypertensine. The University of California appointed Dr. Braun Mendez to deliver the Morris Herzstein lecture. Dr. Braun Mendez will leave Argentina for New York in January 1942. He will deliver the lecture in San Francisco early in March 1942.

#### Society News

The eighth congress of the Pan American Medical Association will meet in Buenos Aires in August of this year. The subjects listed for discussion are prevention of tuberculosis, virus and virus diseases and chemotherapy. Twenty-four sections will be in session. Prof. José Arce is president of the committee on organization and Dr. José Valls is secretary.

Further information can be obtained from the secretary general, Calle Paraguay 2240, Buenos Aires.

During the celebration of the twenty-fifth anniversary of the Argentine Liga Israelita contra la Tuberculosis a new pavilion was dedicated in the province of Córdoba. It has a capacity for one hundred beds and full equipment.

#### Personals

Dr. José M. Leiro of the institute of the history of medicine in Buenos Aires has left for the United States to study at the University of North Carolina and at Johns Hopkins.

Dr. Jorge A. Taiana, chief surgeon of the surgical clinic of the University of Buenos Aires has left for Harvard University, under a Rockefeller grant, to study thoracic surgery.

### FINLAND

(From Our Regular Correspondent)

March 28, 1941.

Previous to the Finnish-Russian War of 1939-1940 the nutritional situation in Finland had been on a fairly satisfactory level. The most troublesome problem was shortage of vitamin D, resulting in a great amount of rachitis in children of families with low incomes. The greatest enemy of health in adults, tuberculosis, was rapidly coming under control. The improved financial standing of the working class since Finland became independent and a well organized educational antituberculosis campaign were the chief factors that led to the great reduction in the mortality figures as well as a general improvement of health conditions.

The consequences of the short but disastrous war with the Soviet soon became evident. The results of twenty years of hard work for the improvement of the health of the people were undone as a result of the war of one hundred days.

In order to care for the wounded soldiers, tuberculosis sanatoriums had to be emptied and the patients sent to their homes or to other families. When, as a consequence of the peace half a million people lost their homes, they had to be taken into houses which in many instances already were crowded. All this led within a short time to a great increase in the tuberculosis morbidity. The shortage of food and difficulties in securing vitamins and other medicines contributed to the increase of morbidity in other respects. The mental depression following the war naturally also was a factor which lowered the vitality of our people and increased the tendency to sickness.

In these times of great need we have received valuable help from many countries. In this connection we especially thank the many American doctors and manufacturers of medicine who, through the Finnish legation in Washington, have sent us valuable supplies of vitamins and other useful drugs. These supplies have rapidly been forwarded to the people most in need of them, i. e. families of the evacuated and those who live on the new eastern border. A large reconstruction work is being done, and we hope that we soon shall have passed the worst times.

### Marriages

MAURICE KAUFMANN, Cumberland, Ky., to Miss Sara E. Combs of Manchester, Ky., in Louisville, March 14.

JOHN W. BOLEN JR., Beckley, W. Va., to Miss Marie L. Hart of Denver at Atlanta, Ga., March 17.

ARTHUR J. BUTT, Fort Jackson, S. C., to Miss Florence Barbara McCravy of Columbia, April 27.

ARTHUR CALVIN BROUGHTON JR. to Miss Mary Frances Hunter, both of Raleigh, N. C., in April.

CHARLES RUSSELL ROBINS JR. to Miss Susan Clay, both of Richmond, Va., April 19.

SAMUEL EISENBERG to Miss Ada Rosenhouse, both of New York, April 27.

## Deaths

**Julius Friedenwald** \* Baltimore; College of Physicians and Surgeons, Baltimore, 1890; chairman of the Section on Gastro-Enterology and Proctology of the American Medical Association, 1929-1930; professor emeritus of gastroenterology at the University of Maryland School of Medicine and College of Physicians and Surgeons; past president of the American Gastroenterological Association and the Baltimore Medical Society; member of the Association of American Physicians; fellow of the American College of Physicians; visiting gastroenterologist to the Mercy Hospital; consultant in digestive diseases, Union Memorial Hospital, Church Home and Infirmary, Sinai Hospital and the Hospital for Women; trustee of the Institute for Advanced Study, Princeton, N. J.; co-author of "Guide to Clinical Laboratory Diagnosis," "Diet in Health and Disease," "Dietetics for Nurses" and "Secondary Gastrointestinal Disorders"; aged 74; died, June 8, of carcinoma of the bladder.

**Ralph Berger Seem** \* Boston; Johns Hopkins University School of Medicine, Baltimore, 1906; member of the Medical and Chirurgical Faculty of Maryland; medical superintendent of the James Walker Memorial Hospital, Wilmington, N. C., from 1908 to 1912; at various times assistant superintendent and acting superintendent of the Johns Hopkins Hospital, Baltimore, medical director of the Billings Memorial Hospital of the University of Chicago, superintendent of the Peking (China) Union Medical College Hospital; at one time professor of hospital administration, Stanford University School of Medicine, San Francisco, and superintendent of the hospitals; formerly assistant director of the Massachusetts General Hospital; aged 60; died, May 14.

**Robert Merriam Rogers** \* Brooklyn; Long Island College Hospital, Brooklyn, 1907; member of the American Academy of Ophthalmology and Otolaryngology; fellow of the American College of Surgeons; clinical professor of ophthalmology at his alma mater; attending ophthalmic surgeon, Long Island College Hospital; attending ophthalmologist, St. John's Hospital and House of St. Giles the Cripple; director, department of ophthalmology, Coney Island Hospital; consulting ophthalmologist, city bureau of charities, and division for the blind, New York State Department of Social Welfare; aged 57; died, May 13, of coronary occlusion.

**William Neil McDonell** \* Medical Director, Captain, United States Navy, San Francisco; University of Minnesota College of Medicine and Surgery, 1903; member of the House of Delegates of the American Medical Association from 1922 to 1932; veteran of the Spanish-American and World wars; entered the Medical Corps of the United States Navy Sept. 19, 1904 and retired Aug. 1, 1940; received the Victory Medal, Grant Fleet Clasp, the Nicaraguan Campaign Medal and the Navy Expeditionary Medal; fellow of the American College of Surgeons; aged 64; died, May 11, in the United States Naval Hospital, Mare Island.

**Earl Sprague Bullock**, Detroit; Detroit College of Medicine, 1893; member of the Michigan State Medical Society; assistant professor of clinical medicine at his alma mater, now known as the Wayne University College of Medicine; veteran of the Spanish-American and World wars; at one time physician in chief of the New Mexico Cottage Sanatorium, Silver City, N. M.; on the staffs of the Leland Sanatorium, Ypsilanti, and the Shurly Hospital; aged 69; died, May 1.

**Robert Garfield Savage**, River Forest, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1905; member of the Illinois State Medical Society; fellow of the American College of Surgeons; formerly assistant clinical professor of obstetrics at the Loyola University School of Medicine, Chicago; for many years on the staff of the Oak Park (Ill.) Hospital; aged 59; died, May 7.

**Frank Joseph Frosch** \* Philadelphia; Hahnemann Medical College and Hospital of Philadelphia, 1907; Jefferson Medical College of Philadelphia, 1908; associate professor of gynecology at the Hahnemann Medical College and Hospital; fellow of the American College of Surgeons; gynecologist, Hahnemann Hospital, Philadelphia, and the Allentown (Pa.) State Hospital; aged 59; died, May 14.

**James Franklin Irving**, Yorkton, Sask., Canada; Manitoba Medical College, Winnipeg, 1900; past president of the Council of the College of Physicians and Surgeons of Saskatchewan; fellow of the American College of Surgeons;

attending surgeon, Queen Victoria Hospital; aged 63; died, April 20, in the Regina General Hospital, Regina, of injuries received in an automobile accident.

**Frederick Benoni Sweet** \* Springfield, Mass.; Yale University School of Medicine, New Haven, Conn., 1893; past president of the New England Surgical Society; fellow of the American College of Surgeons; consulting surgeon, Springfield Hospital and Shriners' Hospital for Crippled Children, Springfield, Mary Lane Hospital, Ware, and Wing Memorial Hospital, Palmer; aged 70; died, May 10.

**James Ives Edgerton** \* New York; Jefferson Medical College of Philadelphia, 1894; at one time adjunct professor of gynecology, New York Polyclinic Medical School and Hospital, New York; fellow of the American College of Surgeons; formerly surgeon, New York Polyclinic Medical School and Hospital, and St. Elizabeth's Hospital; aged 70; died, May 8, in the New York Hospital.

**Ralph Parker Folsom** \* Poughkeepsie, N. Y.; Columbia University College of Physicians and Surgeons, New York, 1908; instructor of psychiatry at his alma mater from 1919 to 1921; member of the American Psychiatric Association and the Association for Research in Nervous and Mental Diseases; superintendent of the Hudson River State Hospital; aged 65; died, May 12.

**Frederick Paul Murphy**, Lowell, Mass.; Tufts College Medical School, Boston, 1905; member of the Massachusetts Medical Society and the New England Obstetrical and Gynecological Society; for many years public school physician; aged 60; on the staff of St. John's Hospital, where he died, April 26, of coronary thrombosis and arteriosclerosis.

**Raymond A. Wallace**, Chattanooga, Tenn.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; member of the Tennessee State Medical Association and the Southeastern Surgical Congress; fellow of the American College of Surgeons; on the staff of the Baroness Erlanger Hospital; aged 65; died, April 30.

**Alvin H. Rockwell** \* Kalamazoo, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1883; past president and secretary of the Kalamazoo Academy of Medicine; for many years health officer and director of health and welfare of Kalamazoo; aged 90; died, May 3, of cerebral hemorrhage.

**Arthur Wesley Knox** \* Sanford, Fla.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1916; member of the Florida Medical Association; past president of the Seminole County Medical Society; served with the Canadian Army during the World War; aged 57; died, May 1, of cerebral hemorrhage.

**Henry Charles Wales**, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1899; L.R.C.P., London and M.R.C.S., England, 1902; served during the World War; past president of the Academy of Medicine, Toronto; on the consulting staff of the Toronto Western Hospital; aged 65; died, April 26.

**Francis Gorman Gleason** \* A. Surg. Licut. (j. g.) U. S. Navy, retired, Denver; Loyola University School of Medicine, Chicago, 1930; entered the navy June 26, 1929 and retired April 1, 1934 for incapacity resulting from an incident of service; aged 39; died, May 12, in the Fitzsimons General Hospital.

**William Paul Petrie** \* Caro, Mich.; Vanderbilt University School of Medicine, Nashville, Tenn., 1925; president of the Tuscola County Medical Society; member of the school board; chief examining physician for the county draft board; aged 41; was found dead, May 14, of an incised wound, self inflicted.

**Abram Richard Stern**, Danbury, Conn.; Columbia University College of Physicians and Surgeons, New York, 1899; member of the Medical Society of the State of New York; aged 66; died, May 8, in the Harkness Pavilion of the Columbia-Presbyterian Medical Center, New York.

**Paul Benjamin Bender** \* Philadelphia; Jefferson Medical College of Philadelphia, 1915; member of the American Academy of Pediatrics; served during the World War; on the staff of the Kensington Hospital for Women; aged 54; died, May 13, in the United States Naval Hospital.

**Daniel Davis** \* Washington, D. C.; Johns Hopkins University School of Medicine, Baltimore, 1913; professor of clinical obstetrics at the Georgetown University School of Medicine; served during the World War; aged 54; died, April 17, in the Georgetown University Hospital.

**Benjamin Clifford John**, Morgantown, W. Va.; University of Maryland School of Medicine and College of Physicians, Baltimore, 1920; member of the West Virginia State Medical Association; aged 44; died, April 25, in the Barnes Hospital, St. Louis, of pulmonary abscess.

**Dikran Maruke Yazujian** @ Trenton, N. J.; University of Pennsylvania School of Medicine, Philadelphia, 1909; fellow of the American College of Surgeons; aged 61; on the staff of the Mercer Hospital, where he died, April 27, of carcinoma of the sigmoid flexure.

**George Walter Smail**, Veedersburg, Ind.; Central College of Physicians and Surgeons, Indianapolis, 1898; served during the World War; aged 67; died, April 27, in the Veterans Administration Facility, Marion, of hypertension, arteriosclerosis and myocarditis.

**Fred Attwood Dennis**, Crawfordsville, Ind.; Medical College of Indiana, Indianapolis, 1898; member of the Indiana State Medical Association; county health officer; on the staff of the Culver Hospital; aged 65; died, May 4, of cerebral hemorrhage.

**Theodore Bacmeister** @ Chicago; University of Michigan Homeopathic Medical School, Ann Arbor, 1900; on the staffs of the Illinois Masonic Hospital, Ravenswood Hospital and the Belmont Hospital; aged 65; died, May 17, of coronary thrombosis.

**Allen Baker Painter** @ Mill Hall, Pa.; Medico-Chirurgical College of Philadelphia, 1899; past president of the Clifton County Medical Society; aged 67; on the staff of the Lock Haven (Pa.) Hospital, where he died, April 24, of lymphangitis.

**John Edward Canfield** @ Herkimer, N. Y.; Albany Medical College, 1903; past president of the Herkimer Academy of Medicine; served during the World War; on the staff of the Herkimer Memorial Hospital; aged 64; died, May 10.

**John Robert Pence** @ Minot, N. D.; Northwestern University Medical School, Chicago, 1909; county health officer; past president and secretary of the Northwest District Medical Society; aged 56; died, April 29, of pneumococcal meningitis.

**Roy Alfred Page**, Magdalena, N. M.; New York Homeopathic Medical College and Hospital, New York, 1894; formerly Livingston (N. Y.) County coroner; aged 69; died April 27, of bronchopneumonia and chronic myocarditis.

**Perry Robert Hungerford** @ Concord, Mich.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; past president of the Jackson County Medical Society; aged 66; died, May 3, in the Mercy Hospital, Jackson.

**Harris Allen Gant**, Columbia, Tenn.; University of Pennsylvania Department of Medicine, Philadelphia, 1876; for many years a member and at one time president of the state board of health; aged 89; died, May 5, of cerebral hemorrhage.

**Stella Quinby Root** @ Stamford, Conn.; New York Medical College and Hospital for Women, 1896; aged 69; died, April 17, in the Stamford Hospital of coronary thrombosis, chronic hypertension, nephritis and diabetes mellitus.

**Oscar H. Rogers**, Wellesley Hills, Mass.; College of Physicians and Surgeons, medical department of Columbia College, New York, 1883; aged 83; died, May 17, in the Massachusetts General Hospital, Boston, of pneumonia.

**Homer Odessa Leonard**, Kansas City, Mo.; Chicago Medical College, 1875; member of the Missouri State Medical Association; fellow of the American College of Surgeons; aged 88; died, April 24, of carcinoma of the prostate.

**A. J. Kershaw**, Miami, Fla.; Meharry Medical College of Walden University, Nashville, Tenn., 1907; aged 58; died, April 20, in the Pine Ridge Hospital, West Palm Beach, of injuries received in an automobile accident.

**William Elmer Anderson**, Washington, Iowa; Chicago Homeopathic Medical College, 1894; member of the Iowa State Medical Society; aged 77; died, May 7, in St. Joseph's Hospital, New Hampton, of embolism.

**George Stephen Bliss**, South Pasadena, Calif.; Dartmouth Medical School, Hanover, N. H., 1904; at one time superintendent of the Indiana School for Feeble-minded Youths, Fort Wayne; aged 68; died in May.

**George Bassett Butt**, Chicago; Northwestern University Medical School, Chicago, 1900; member of the Illinois State Medical Society; aged 65; died, May 7, in St. Luke's Hospital of chronic nephritis.

**Marlowe Clifford Wolfe**, Madera, Pa.; University of Louisville (Ky.) School of Medicine, 1926; aged 38; died in April in the Meadville City Hospital, Meadville, of an overdose of a sleeping potion.

**Zenas Freeman Lamb**, Keene, N. H.; Bellevue Hospital Medical College, New York, 1887; member of the New Hampshire Medical Society; aged 76; died, April 28, of heart disease and arteriosclerosis.

**Huston B. Terry**, Acworth, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1900; member of the Medical Association of Georgia; aged 69; died, March 18, of coronary occlusion.

**Raymond Earl Swope**, Rockville, Ind.; Medical College of Indiana, Indianapolis, 1900; served during the World War; aged 65; died, April 24, in the Union Hospital, Terre Haute, of heart disease.

**James Buchanan Barth**, Charleroi, Pa.; University of Vermont College of Medicine, Burlington, 1884; Jefferson Medical College of Philadelphia, 1890; aged 84; died, May 7, of arteriosclerosis.

**Charles Buford McCown** @ Aberdeen, Miss.; Memphis (Tenn.) Hospital Medical College, 1903; on the staff of the Aberdeen Hospital; aged 62; died, April 27, of carcinoma of the lung.

**John Albert Lambert**, Indianapolis; Central College of Physicians and Surgeons, Indianapolis, 1891; aged 82; died, April 28, in the Methodist Hospital of arteriosclerosis and uremia.

**William Thomas Franklin** @ Anacoco, La.; Memphis (Tenn.) Hospital Medical College, 1899; aged 74; died, April 21, in the Highland Sanitarium, Shreveport, of heart disease.

**Fletcher W. Powers**, Barrett, Minn.; Minneapolis College of Physicians and Surgeons, 1902; owner and medical director of the Barrett Hospital; aged 68; died, April 26, of pneumonia.

**Eleanor Way-Allen Mellen**, Newton, Mass.; Woman's Medical College of Pennsylvania, Philadelphia, 1903; member of the Massachusetts Medical Society; aged 72; died, April 19.

**Robert Schulman** @ Morristown, N. J.; Columbia University College of Physicians and Surgeons, New York, 1906; medical director of the Aurora Institute; aged 60; died, May 15.

**Charles Edson Stickney**, Constable, N. Y.; Bellevue Hospital Medical College, New York, 1888; member of the Medical Society of the State of New York; aged 77; died, April 21.

**Frederick Clinton Robertson**, Jersey City, N. J.; University of the City of New York Medical Department, New York, 1894; aged 69; died, April 5, of coronary occlusion.

**Lawrence Harry Sander**, Cincinnati; Medical College of Ohio, Cincinnati, 1901; aged 57; died, May 1, in the Good Samaritan Hospital of coronary occlusion and hypertension.

**Cleveland Davis**, Itta Bena, Miss.; Atlanta (Ga.) College of Physicians and Surgeons, 1906; served during the World War; aged 56; died, May 4, of coronary thrombosis.

**George C. Goodman**, Louisville, Ky.; University of Louisville Medical Department, 1890; aged 75; died in May in the Norton Memorial Infirmary of chronic myocarditis.

**Jay S. Mead**, Lorain, Ohio; University of Michigan Homeopathic Medical School, Ann Arbor, 1883; aged 87; died, April 25, in St. Joseph's Hospital of chronic myocarditis.

**Luther E. Wiggins**, Joaquin, Texas; Memphis (Tenn.) Hospital Medical College, 1907; aged 63; was found dead, April 12, of a self-inflicted bullet wound.

**Harry Scott Braman**, Homer, N. Y.; College of Physicians and Surgeons, Baltimore, 1892; aged 68; died, April 23, in Niagara Falls of cerebral thrombosis.

**Charles Ogden Dorchester** @ Chicago; Bennett College of Eclectic Medicine and Surgery, Chicago, 1894; aged 80; died, April 27, of coronary occlusion.

**George Whitney Hine**, Berlin Heights, Ohio; Western Reserve University Medical Department, Cleveland, 1888; aged 83; died, April 26, of heart disease.

**Rachel Edna Moulton**, Minneapolis; Minneapolis College of Physicians and Surgeons, Minneapolis, 1902; aged 76; died, April 23, of coronary sclerosis.

**Charles Harold Eye**, Chicago; University of Illinois College of Medicine, Chicago, 1925; aged 41; died, May 1, of chronic myocarditis.

**J. Ashley Thompson**, Sacramento, Calif.; Medical College of Alabama, Mobile, 1880; aged 90; died, April 14, of chronic myocarditis.

**Joseph Meyer**, Paris, Texas; University of Louisiana Medical Department, New Orleans, 1874; aged 92; died, April 27, of senility.

**John Benedict Mason**, Chicago; Rush Medical College, Chicago, 1894; aged 71; died, May 11, of coronary thrombosis.

Correspondence

RAPID CLINICAL TEST FOR DIPHTHERIA  
FOUND UNRELIABLE

To the Editor:—In THE JOURNAL, Aug. 19, 1939, page 675, appeared a short article by Wayne W. Fox and others on their experience with a rapid clinical test for diphtheria. In this article it was stated that this simple and rapid test, when negative, might offer sufficient reason for withholding therapeutic antitoxin until the cultures could be reported. Recently Dr. Howard Bierman and Dr. Richard Maxwell gathered data at the St. Louis Isolation Hospital which indicated that negative results from this test could not be relied on. Their experience was more extensive than that of Fox and his associates. Since it is well known that the effectiveness of diphtheria antitoxin depends largely on the promptness with which it is given, it seems to me most unfortunate that the experience of Fox and his associates should remain unchallenged if there is any doubt at all about the reliability of the test.

DAVID BARR, M.D., St. Louis.

TRANSFUSION OF PLASMA

To the Editor:—I read with interest the report in a recent issue of THE JOURNAL (May 3, p. 2015) by Dr. Frank Mayner concerning a death following a transfusion of blood plasma. My purpose in this communication is to offer a possible explanation for the lethal reaction.

In describing the collection of blood for the preparation of plasma, the author states that 50 cc. of 2.5 per cent sodium citrate was used for 450 cc. of blood, giving an effective concentration of sodium citrate of 0.25 per cent. This is the minimum concentration originally found effective for citrate transfusions by Dr. Lewisohn, whose idea in setting the concentration so low was to avoid the toxic effect of the citrate ion.

It has since been found (1) that, while 0.25 per cent is sufficient for fresh blood transfusions, this concentration does not entirely prevent coagulation but merely retards it; (2) that sodium citrate is not particularly toxic even in relatively large doses when administered by the drip method, since the body tissues quickly oxidize the citrate ion. Therefore, most operators now use 50 cc. of 3.8 per cent citrate solution for transfusions of 500 cc. of fresh blood. For stored blood and for the preparation of plasma even higher concentrations are advisable, so that in the recent project sponsored by the Blood Transfusion Betterment Association for the Preparation of Plasma for Britain 50 cc. of 5 per cent sodium citrate was used for every 500 cc. of blood.

My guess is that in the case reported in THE JOURNAL there was a slow conversion of the fibrinogen in the donor's blood into fibrin, with a release of thrombin (fibrin ferment). Thrombin is also present in fresh blood serum and is believed to be responsible for the toxicity of such serum. On the other hand, in stored serum the thrombin deteriorates so that such serum evidently is safe for use, according to the work of Levinson and his co-workers (Levinson, S. O.; Neuwelt, Frank, and Necheles, Heinrich: Human Serum as a Blood Substitute, THE JOURNAL, Feb. 10, 1940, p. 455). The patient in question apparently received not a plasma transfusion but a fresh serum transfusion. If this interpretation is correct, the interposition of a filter to remove the minute fibrin clots would not have prevented the reaction, since thrombin would pass through such a filter.

To explain the reaction, Dr. Mayner cites the reports by Plummer and Gutteridge of fatal reactions following repeated transfusions from the same donors after intervals of a month or longer. While it is true that in Dr. Mayner's case the

plasma used for the transfusion was prepared from the same donor (the patient's father) used for a previous transfusion, still in this case plasma, not whole blood, was transfused. As Wiener and Peters have shown (Wiener, A. S., and Peters, H. R.: Hemolytic Reactions Following Transfusions of Blood of the Homologous Group, with Three Cases in Which the Same Agglutinin was Responsible, *Ann. Int. Med.* 13:2306 [June] 1940), repeated transfusions even with blood of the correct group can give rise to fatal hemolytic reactions, but the antigens involved are in the red blood cells, not in the plasma, so that this explanation could not apply in the case reported by Dr. Mayner.

A. S. WIENER, M.D., Brooklyn.

Medical Examinations and Licensure

COMING EXAMINATIONS

BOARDS OF MEDICAL EXAMINERS  
BOARDS OF EXAMINERS IN THE BASIC SCIENCES  
Examinations of boards of medical examiners and boards of examiners in the basic sciences were published in THE JOURNAL, June 21, page 2811.

NATIONAL BOARD OF MEDICAL EXAMINERS  
NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Various centers, Sept. 10-12. Part III. Various centers, June or July. Exec. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

EXAMINING BOARDS IN SPECIALTIES  
AMERICAN BOARD OF ANESTHESIOLOGY: *Written*. Part I. Various centers, Nov. 1. Final date for filing application is Aug. 4. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York City.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Written*. Nov. 3. Final date for filing application is Sept. 23. *Oral*. Dec. 12-13. Final date for filing application is Nov. 8. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written*. Oct. 20. Final date for filing application is Sept. 1. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written*. Part I. Group B. Jan. 3. *Oral*. Part II. Groups A and B. Atlantic City, May or June. Final date for filing application is 90 days in advance of the examination. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral*. Portland, July 15; Chicago, Oct. 18. *Written*. March 7, 1942. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: Washington, January. Final date for filing application is Nov. 1. Sec., Dr. Guy A. Caldwell, 1640 State St., New Orleans, La.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 16-18. Final date for filing application is July 1. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: *Oral*. Boston, Oct. 7-8, immediately following the annual meeting of the American Academy of Pediatrics. *Written*. Locally, Aug. 22. Sec., Dr. C. A. Aldrich, 707 Fullerton Ave., Chicago.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: *Oral*. New York, Dec. 19-20. Final date for filing application is Oct. 5. Sec., Dr. Walter Freeman, 1028 Connecticut Ave., N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: *Oral*. All groups. Cincinnati, Sept. 19-21. Final date for filing application is Aug. 1. Sec., Dr. Byrl R. Kirklín, 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Written*. Part I. Various centers, Oct. 6. Sec., Dr. J. Stewart Rodman, 225 S. Fifteenth St., Philadelphia.

AMERICAN BOARD OF UROLOGY: Chicago, February. Final date for filing application is three months before date of examination. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

Rhode Island January Report

The Rhode Island Board of Examiners in Medicine reports the written examination for medical licensure held at Providence, Jan. 2-3, 1941. The examination covered 8 subjects and included 50 questions. An average of 80 per cent was required to pass. Five candidates were examined, all of whom passed. Three physicians were licensed to practice medicine by endorsement of credentials of the National Board of Medical Examiners. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Georgetown University School of Medicine..	(1938) 84,	(1939)	88
Tufts College Medical School.....	(1936)		87
St. Louis University School of Medicine.....	(1939)		86
University of Vermont College of Medicine.....	(1939)		85
School	LICENSED BY ENDORSEMENT	Year Grad.	
Harvard Medical School.....	(1938)		
Tufts College Medical School.....	(1938)		
New York Medical College and Flower Hospital.....	(1937)		



## Bureau of Legal Medicine and Legislation

### MEDICOLEGAL ABSTRACTS

**Insurance, Accident: Staphylococcic Infection Induced by Blowing Nose Not Due to Accidental Means.**—The defendant insurance company issued a policy providing certain benefits if Smith's death resulted "directly and independently of all other causes from bodily injuries effected solely through external, violent and accidental means." Smith had a severe head cold toward the end of February 1939 and for about a week frequently blew and wiped his nose with his handkerchief. He complained of soreness in his nose March 6 and two days later his wife observed "a little raw, very red, wet spot" just on the inside of the outer wall of the right nostril that "looked sort of like a little nick in the skin." The nose was not swollen then but a swelling was noticeable the following day, and Dr. Stinson was called. According to Dr. Stinson, Smith then had a temperature of 101.6 F. and complained of general bodily aches and pains, especially in the chest. Dr. Colbert was called into consultation and observed on his first visit a definite swelling in the nose, which was characterized as a boil that was well localized. The only treatment then instituted was to strap the patient's chest. Four days later the boil had extended and inflammation and infection had spread to the face and eye. The patient was then taken to a hospital, where a lumbar puncture was made and fluid drawn from the spine which indicated the presence of staphylococci. Death ensued as the result of meningitis produced by the staphylococci. Claiming that death was due to accidental means, Smith's widow sued the insurance company to recover the benefits referred to. From a judgment in favor of the insurer, the widow appealed to the court of appeals of Tennessee.

The evidence adduced at the trial, said the court of appeals, indicated that the staphylococcus is a microscopic organism which is always present in the skin and is harbored in the mouth, about the teeth and in the nasal passages. Boils or furuncles are always formed on external surfaces of the body where there is hair, usually in the hair follicles or that part of the skin from which the hair emerges. There must, however, be some lesion or abrasion, or break in the skin to afford a port of entry for the staphylococci. The medical testimony was undisputed that the constant blowing and wiping of the nose caused it to become so raw and irritated as to afford a port of entry for the staphylococci, that this caused the boil to form and that the infection spread until the germs got into the blood stream, causing the meningitis which resulted in Smith's death. But, continued the court, these facts are not sufficient to establish that Smith's death was effected by accidental means, on which the liability of the insurer is predicated by the policy here in question. The court then adverted to the rule of law, adopted by the courts of Tennessee and by "the majority of the courts," which provides, in effect, that means are not accidental, within the meaning of policies of this sort, if death or injury is the result of the voluntary or intentional act of the insured, even though the result is unforeseen or unexpected, in the absence of some mishap or mischance or slip in the doing of the act itself.

In arriving at a decision in this case, the court of appeals relied on *Ramsey v. Fidelity & Casualty Co.*, 143 Tenn. 42, 223 S. W. 841, which cited with approval *Maryland Casualty Co. v. Spitz*, 3 Cir., 246 F. 817, 159 C. C. A. 119. In the Spitz case the insured in rubbing a boil on his neck with hands soiled with blood and other substances broke a scab, permitting germs of erysipelas to enter the circulatory system. The court in the Spitz case held that the death from erysipelas did not result from accidental means, as the breaking of the scab was a probable result of, and one reasonably to be expected from, the insured's intentional act. The facts in the Spitz case, continued the court of appeals, are not materially different from those in this case. The constant blowing and wiping of his nose by the insured was his voluntary act, and it was the ordinary and

natural result of such an operation that his nose should become raw and irritated and afford a means of admitting the germs in question into the circulatory system. There is no evidence of any slip or mishap in blowing or wiping his nose which caused it to become raw and afford a portal of entry to the staphylococci. It cannot, therefore, be said that the infection was the result of accidental means.

Smith's widow contended that it would be a reasonable deduction from the evidence to find (1) that a grain of sand or a flake of tobacco in Smith's pocket might have become attached to his handkerchief and caused the nick or splint in the tender skin of his nose; or (2) that his handkerchief had been stiffly laundered and that the edge of it cut the tender skin of the nostril, or (3) that Smith's hand slipped, causing his finger nail to inflict the injury; and that either of these findings would warrant the conclusion that the nick was caused by accidental means. The difficulty with this contention, answered the court, is that it stems from a deduction, which in turn proceeds from a pure conjecture, as there is no evidence in the record on which it could be based.

The court could find no evidence in the record which would warrant a conclusion that the infection was the result of accidental means, and accordingly the judgment of the trial court in favor of the insurer was affirmed. Subsequently certiorari was denied by the Supreme Court of Tennessee.—*Smith v. Actna Life Ins. Co.*, 147 S. W. (2d) 1058 (Tenn., 1941).

**Malpractice—Necessity for Expert Testimony.**—The defendant physician operated on the plaintiff for a right direct inguinal hernia. Contending that, because of the operation his right spermatic cord had become strangulated, resulting in the atrophy of his right testicle and in a loss of sexual desire, the plaintiff sued the defendant physician. From a judgment for the defendant on a demurrer to the plaintiff's evidence, the plaintiff appealed to the Supreme Court of Kansas.

The only expert testimony produced by the plaintiff was that given by the defendant whom the plaintiff called as his own witness. The defendant described in detail the operative procedure he used and denied that he had injured in any way the spermatic cord or that the atrophy of the testicle resulted from the operation. It was the defendant's opinion, moreover, that even if the cord had been severed or strangulated during the operation the testicle would not have become atrophied for a considerable time and that such atrophy should have no effect on the plaintiff's ability to work or on his sexual desire. The defendant stated that he was familiar with the standard of care and skill used by physicians in his community, that he had performed between seven and eight hundred herniotomies and that he followed the usually accepted procedure used by physicians in that locality.

The Supreme Court pointed out that what constitutes proper treatment in any particular case is a medical question to be testified to by physicians as expert witnesses, since neither lay witnesses nor juries are sufficiently conversant with the science and practice of medicine to enable them to determine such a question without some expert explanation. The only explanation offered by the plaintiff in the present case was the defendant's testimony. That testimony, said the Supreme Court, not only failed to establish negligence but actually refuted it. The only thing the plaintiff proved was that, if the defendant had been negligent in performing the operation, the injury claimed could have, or might have, resulted therefrom. That, in the opinion of the court, was not proof of negligence. The judgment in favor of the defendant was accordingly affirmed.—*Pierce v. Edgerton*, 98 P. (2d) 129 (Kan., 1940).

## Society Proceedings

### COMING MEETINGS

American Physiotherapy Association, Asilomar, Calif., July 13-18. Miss Evelyn Anderson, Stanford University, Calif., Secretary.  
National Medical Association, Chicago, Aug. 18-22. Dr. John T. Givens, 1108 Church St., Norfolk, Va., General Secretary.

## Current Medical Literature

### AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1931 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (\*) are abstracted below.

#### Alabama State Medical Assn. Journal, Montgomery

10:293-324 (March) 1941

- Duties of Physician in Control of Communicable Diseases. O. L. Chason, Mobile.—p. 293.  
Influenzal Meningitis: Recovery Following Antihaemophilus Influenzae Type B Serum (Rabbit) and Chemotherapy. W. E. Wilson, Russellville.—p. 298.  
Surgical Management of Toxic Goiter. G. B. Greene, Birmingham.—p. 301.  
Ectopic Pregnancy. W. C. Kennedy, Florence.—p. 303.  
Caesarean Section. P. Woodall, Birmingham.—p. 305.  
Hernia of Ileum Through Defect in Mesentery. H. R. Markheim, Cullman.—p. 307.

#### American Journal of Pathology, Boston

17:141-292 (March) 1941. Partial Index

- "Interference" in Mixed Infections of Bartonella and Eperythrozoon in Mice. E. E. Tyzzer, Boston.—p. 141.  
Experimental Measles: Lymphoid Tissues of Animals Inoculated with Virus of Human Measles. H. Gordon and H. T. Knighton, Louisville, Ky.—p. 165.  
Degenerate versus Multipolar Neurons in Sensory Ganglions. R. C. Truex, New York.—p. 211.  
Treatment of Spontaneous Breast Adenocarcinomas in Mice with Extracts of Spleen or Yeast. R. Lewisohn, C. Leuchtenberger, R. Leuchtenberger and D. Laszlo, New York.—p. 251.  
Primary Fibromyxosarcomas of Heart and Pulmonary Artery. S. R. Haythorn, W. B. Ray and R. A. Wolff, Pittsburgh.—p. 261.  
Bacterial Localization in Kidneys. L. M. Asher and J. K. Sokol, Chicago.—p. 273.  
Exogenous Tumors of Thyroid Gland. C. W. Mayo and C. P. Schlicke, Rochester, Minn.—p. 283.

#### Archives of Ophthalmology, Chicago

25:391-538 (March) 1941

- Some Ocular Phenomena Produced with Polarized Light. D. G. Cogan, Boston.—p. 391.  
\*The Eye and Sleep. J. E. Lebensohn, Chicago.—p. 401.  
Drusen of Optic Papilla: Clinical and Pathologic Study. B. Samuels, New York.—p. 412.  
Secondary Glaucoma Due to Lens. P. Heath, Detroit.—p. 424.  
Effect of Thyroxine on Incipient Senile Cataracts. D. F. Gillette, Syracuse, N. Y.—p. 438.  
Treatment of Angiomatosis Retinae. H. Kaye, Johannesburg, South Africa.—p. 443.  
New Scotometer. J. N. Evans, Brooklyn.—p. 445.  
Vitamin B in Ophthalmology. C. A. Veasey Jr., Spokane, Wash.—p. 450.  
Effect of Reduced Contrast on Visual Acuity as Measured with Snellen Test Letters. E. Ludvig, Boston.—p. 469.  
Surgical Treatment of Spastic Entropion. A. R. Robbins, Los Angeles.—p. 475.  
Boeck's Sarcoid of Lacrimal Gland: Report of Case. J. Rosenbaum, Montreal, Canada.—p. 477.  
Combination of Phorometer and Accommodation Rule. R. K. Simpson, Randolph Field, Texas.—p. 483.  
Pentothal Sodium Anesthesia in Ophthalmology. L. W. Statt, Pittsburgh.—p. 487.  
Lysozyme and Antibacterial Properties of Tears. R. Thompson, New York.—p. 491.

**The Eye and Sleep.**—Lebensohn points out that the credit of discovering the now recognized sleep regulation center belongs to Ludwig Mauthner. The excitability of the hypothalamus and consequent wakefulness are maintained by peripheral stimulation. A great reduction of impulses is followed progressively by lowering of sympathetic tone, depression of cortical activity and sleep. The ocular apparatus in drowsiness evidences impaired sympathetic function by drooping lids, dry eyes and congested conjunctiva. A similar syndrome in certain

cases of intractable conjunctival asthenopia, sometimes called chronic catarrhal conjunctivitis, suggests that the underlying cause is likewise an impairment of sympathetic function. In such cases the basal metabolic rate is generally somewhat below normal. The condition is relieved by small daily doses of desiccated thyroid. The results of such therapy, according to the author, have been most encouraging in several hundred cases observed in the last few years.

#### Archives of Otolaryngology, Chicago

33:333-508 (March) 1941

- Bone Conduction Changes in Acute Otitis Media. J. H. Hülka, Long Island City, N. Y.—p. 333.  
Sphincter Action of Larynx. J. J. Pressman, Los Angeles.—p. 351.  
Photographic Study of Larynx by Mirror Laryngoscopy. L. H. Clerf, Philadelphia.—p. 378.  
Riedel's Struma. N. Fox, Chicago, and S. Missal, Cleveland.—p. 384.  
Chordoma of Basisphenoid and Basisphenoid: Report of Four Cases. E. Boldrey, San Francisco, and W. J. McNally, Montreal.—p. 391.  
Finger Exploration of Nasopharynx for Diagnosis and Treatment. J. R. Honiss, Rochester, N. Y.—p. 401.  
Sulfathiazole for Treatment of Staphylococcal Meningitis. B. M. Cohen and M. Galpern, Chicago.—p. 415.  
Chronic Progressive Deafness, Including Otosclerosis and Diseases of Inner Ear. G. E. Shambaugh Jr., Chicago.—p. 436.

#### Delaware State Medical Journal, Wilmington

13:35-50 (March) 1941

- Scarlet Fever and Related Streptococcal Infections. E. L. Stebbins, New York.—p. 35.  
Otitis Media. J. E. Marvil, Laurel.—p. 39.

#### Journal of Clinical Endocrinology, Springfield, Ill.

1:195-284 (March) 1941. Partial Index

- Functional Uterine Bleeding. H. B. Richardson, E. T. Engle, R. Hurzrok, New York, and C. F. Fluhmann, San Francisco.—p. 195.  
Vascular Hypertension in Pregnancy: Urinary Excretion of Pregnanediol Glucuronide in Hypertensive Disorders of Pregnancy. C. Bachman, Dorothy Leckley and H. Hirschmann, Philadelphia.—p. 206.  
Endocrine Therapy of Functional Menometrorrhagia and Ovarian Sterility: Parts I and II. E. C. Hamblen, W. K. Cuyler, C. J. Pattee and G. J. Axelson, Durham, N. C.—p. 211.  
Hormone Production of Epithelial Growths: Estrogen, Testosterone and Growth Hormone in Production of Atypical Epithelial Growths in Human Cervical Mucosa. A. Wollner, New York.—p. 228.  
Anorexia Nervosa: Endocrine Factors in Undernutrition. D. J. Stephens, Rochester, N. Y.—p. 257.

#### Laryngoscope, St. Louis

51:115-220 (Feb.) 1941

- Diseases of the Larynx: Material Abstracted During the Year 1940. H. B. Orton, Newark, N. J.—p. 115.  
Sulfanilamide in Otitis Media in Children. E. B. Bilchick and G. H. O'Kane, New York.—p. 197.  
Erysipelas as a Complication Following Mastoidectomy: Case Report. H. D. Harlowe, Virginia, Minn.—p. 202.  
Dentigerous Cyst of Maxillary Sinus: Report of Case. C. W. Pond, Pocatello, Idaho.—p. 209.

51:221-314 (March) 1941

- Allergy in Otorhinolaryngology and Ophthalmology: Review of Recent Current Literature. F. K. Hansel, St. Louis.—p. 221.  
Progressive Analogous Nerve Deafness in Three Successive Generations with Sex Limited Inheritance. M. S. Ersner and M. Saltzman, Philadelphia.—p. 241.  
Limitations of Surgery in Otosclerosis: New Theory for Immediate Improvement of Hearing in Fistula Operations. B. Katz, Los Angeles.—p. 246.  
History of Plastic Surgery. A. P. Seltzer, Philadelphia.—p. 256.  
Bacteriologic Relationship of Dental Infection and Chronic Hyperplastic Sinusitis. R. C. Grove, New York, and J. G. Welch, Lancaster, Pa.—p. 263.  
Scarlet Fever Following Tonsillectomy. H. G. Hadley, Washington, D. C.—p. 269.  
Transient Bacteremia Following Tonsillectomy: Experimental Bacteriologic and Clinical Studies. J. Fischer, Boston, and F. Gottlenker, São Paulo, Brazil.—p. 271.  
Tuberculosis of Tongue. H. P. Schugt, New York.—p. 284.  
Congenital Cyst of Epiglottis: Report of Case. T. M. Irwin, Orlando, Fla.—p. 288.  
Injuries of Larynx; Traumatic and Therapeutic. J. D. Kernan, New York.—p. 292.  
Traumatic Paralysis of Cricothyroid Muscle. T. E. Beyer, Denver.—p. 296.  
Open Safety Pin in Stomach; Removal by Endoscopic Measures Assisted by Single Plane Fluoroscopy. E. L. Myers, St. Louis.—p. 299.

### Missouri State Medical Assn. Journal, St. Louis 38:107-142 (April) 1941

- Challenge of Acute Appendicitis: Diagnostic and Therapeutic Details Designed to Reduce Mortality, with Special Reference to "Delayed" Operation. R. Elman, St. Louis.—p. 107.
- \*Influence of Vitamin C Therapy on Arsenical Sensitivity. A. D. Vail, Springfield.—p. 110.
- Curarization in Metrazol Convulsive Therapy: Method Which Minimizes Traumatic Injury. P. Shelton, Kansas City.—p. 120.
- Hyperthyroidism from the Internist's Point of View. D. L. Sexton, C. J. Sullivan and F. G. Gillick, St. Louis.—p. 122.
- Chronic Clinical Allergy: Calcium and Potassium Therapy. C. J. Sullivan, St. Louis.—p. 125.
- A Common Operative Finding in Appendicitis. R. H. Simpson, Columbia.—p. 128.
- Medical Shock in Pediatrics. C. B. Summers, Kansas City.—p. 129.

**Vitamin C for Arsenical Sensitivity.**—Vail reviews the literature and presents a preliminary report on the study of the influence of vitamin C on arsenical sensitivity. Approximately 50 per cent of patients, mostly women, treated with arsenicals complain of objectionable reactions. The type of antisiphilitic treatment does not seem to influence the blood vitamin C level. Arsenical sensitivity is usually associated with hypovitaminosis C. The few reactions that occur in the presence of normal blood vitamin C values warrant investigation to rule out psychic and other factors. Oral administration of the vitamin is effective but slow and is subject to individual variations. The best results will be obtained by intravenous methods. Severe cases may respond only to oral and intravenous therapy. Spectacular relief of sensitivity symptoms may be obtained by relatively small and heretofore believed ineffective doses of vitamin C given in conjunction with the arsenical medication. Inclusion of vitamin C in arsenical therapy does not lessen the specific response. Vitamin C is a valuable adjunct to present anti-siphilitic therapy.

### New England Journal of Medicine, Boston 224:441-486 (March 13) 1941

- \*Factors in Reduction of Mortality from Pulmonary Abscess. R. H. Overholt and W. R. Rumel, Boston.—p. 441.
- Removal of Iodized Oil by Lumbar Puncture. C. S. Kulik and A. O. Hampton, Boston.—p. 455.
- Autonomic Nervous System Prior to Gaskell. D. Sheehan, New York.—p. 457.
- Susceptibility to and Latency of Poison Ivy Dermatitis. R. J. Reuter, Boston, and S. J. White, Lawrence, Mass.—p. 460.

### 224:487-532 (March 20) 1941

- Folk Medicine in New Hampshire. H. D. Levine, Bristol, N. H.—p. 487.
- Deficiency Diseases: Their Diagnosis and Treatment. C. P. Rhoads, New York.—p. 493.
- How May the General Practitioner Diagnose Cancer of Uterus? F. L. Adair, Chicago.—p. 497.
- Herpes Zoster: Local Anesthesia in Treatment of Pain. L. Secunda, W. Wolf and J. C. Price, Boston.—p. 501.
- Study of Vitamin C Nutrition in Group of School Children: Clinical and Laboratory Studies. Marian M. Crane, Washington, D. C., and P. W. Woods, Augusta, Maine.—p. 503.
- Treatment of Biliary Tract Disease. C. M. Jones, Boston.—p. 509.

**Reduction of Mortality from Pulmonary Abscess.**—To determine whether or not some patients recover from abscess of the lung without hospitalization, Overholt and Rumel investigated 100 patients with lung abscesses of all stages, proved by clinical history and roentgen study and made possible by the cooperation of diagnostic clinics, sanatoriums and private physicians. Even among this highly representative group of patients the results were not much different from those of other reports; 31 patients died of the disease, persistent symptoms were present in 20 and 49 were asymptomatic. The authors present their conception of the proper management of lung abscess, based on the results in 95 cases treated during the last eight years. Of the patients treated by various generally accepted therapeutic measures, excluding external drainage and excision, the mortality was 53 per cent and the cure rate 26 per cent; of those treated by lung resection the mortality rate was 23 per cent and the cure rate 62 per cent, and of those treated by external drainage at an advanced stage of the disease the mortality rate was 32 per cent and the cure rate 26 per cent. Among the patients treated by external drainage at an early stage of the disease the mortality rate was 6 per cent and the cure rate 94 per cent. It is proposed that lung abscesses be separated into simple (a single or a multilocular cavity without secondary

bronchiectasis) and complicated (multiple isolated daughter abscesses located in the surrounding zone of pneumonitis, which do not connect with the primary cavity and do not point on the surface of the lobe) stages. The outstanding factor in a simple abscess developing into a complicated one is time. The duration of most simple abscesses is less than six weeks. Therefore, delay of external drainage parallels directly the bad results obtained. Treatment based on internal drainage of the cavity fails because of the small bronchi that lead from it, which provide neither adequate drainage nor adequate aeration. These two factors must be satisfied before healing will occur. Pulmonary abscess should be considered a surgical disease from its onset, and early drainage should be instituted without delay. The provision for external drainage during the simple stage of the disease is the only type of treatment that has yielded a uniform high cure rate and a low mortality rate. A close analogy can be drawn between the history of treating pulmonary abscess to date and the early history of treating appendicitis. At present pulmonary abscess is generally considered to be a medical disease. The mortality and morbidity rates are high. Early external drainage is looked on with apprehension. The foundation of this fear has several components: the unfavorable results obtained by this procedure without exact preoperative localization of the abscess and surgical aid given only after irreparable damage has occurred. Because of this the general tendency is to cling even more tenaciously to the temporizing medical measures. The authors' opinion is that the only way to obtain low mortality and high cure rates is to employ early external drainage after accurate localization.

### North Carolina Medical Journal, Winston-Salem 2:109-164 (March) 1941

- Uteroplacental Apoplexy: Report of Three Cases. J. P. Hennessy, New York.—p. 109.
- Studies in Histaminase: Effect of Histaminase on the Histamine Wheal. E. W. Vaughan, Greensboro, and W. B. Blanton, Richmond, Va.—p. 116.
- Psychiatry and the Selective Service. E. A. MacMillan, Winston-Salem.—p. 119.
- Artificial Pneumothorax Supplemented with Phrenic Nerve Operation. Allison L. Ormond, Black Mountain.—p. 124.
- Use of Neoprontosil in Idiopathic Ulcerative Colitis: Report of Two Cases. W. R. Stanford and Louise McMillan, Durham, N. C.—p. 131.
- Forcible Delivery. O. H. Jones, Charlotte.—p. 133.
- Mental Hygiene in North Carolina. H. B. Haywood, Raleigh.—p. 139.
- Therapy of Deficiency States. F. M. Hanes, Durham.—p. 142.
- Public Health Work for the Young Doctor. G. M. Cooper, Raleigh.—p. 145.

### Philippine Medical Association Journal, Manila 21:1-62 (Jan.) 1941

- Counterfeit Drugs. P. I. de Jesus, Manila.—p. 1.
- Bacteriologic Examination of Oysters, with Special Reference to Isolation of Eberthella Typhi. A. P. de Roda and P. Gonzalez, Manila.—p. 11.
- Immediate Objectives in Teaching of Ophthalmology and Otorhinolaryngology. H. Velarde, Manila.—p. 15.
- Spontaneous Pneumothorax: Report of Cases Encountered Among Students of the University of the Philippines. M. G. Tan, Manila.—p. 19.
- Treatment of Chronic Ulcers of Legs with Use of Unna's Paste Boot. L. B. Greentree and L. F. Gallardo, Manapla.—p. 31.

### Public Health Reports, Washington, D. C. 56:421-480 (March 7) 1941

- Carbon Monoxide: Its Toxicity and Potential Dangers. Division of Industrial Hygiene.—p. 421.
- Financial Support of Hospitals Controlled by State and Local Governments. E. H. Pennell, J. W. Mountin and Kay Pearson.—p. 433.
- Qualifications of Professional Public Health Personnel: V. Laboratory Workers. M. Derryberry and G. Caswell.—p. 445.

### 56:481-546 (March 14) 1941

- Alcoholism and Public Health. L. Kolb.—p. 485.
- Hospitals Existing Singly in Counties Have Similar Financial Structure. J. W. Mountin, E. H. Pennell and Kay Pearson.—p. 498.
- Human Riboflavin Requirement Estimated by Urinary Excretion of Subjects on Controlled Intake. W. H. Sebrell Jr., R. E. Butler, J. G. Woolley and H. Isbell.—p. 510.
- Benzene (Benzol): Its Toxicity and Potential Dangers. Division of Industrial Hygiene.—p. 519.

## FOREIGN

An asterisk (\*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

**British Journal of Experimental Pathology, London**

22:1-58 (Feb.) 1941

- Healing of Untreated Experimental Wounds. Lotte Dann, A. Glücksmann and Katharine Tansley.—p. 1.  
Vascular Regeneration in Experimental Wounds and Burns. A. F. W. Hughes and L. Dann.—p. 9.  
Tissue Anoxia and Blood Coagulation. J. H. Quastel and E. Racker.—p. 15.  
New Diazo Methods for Determination of Bilirubin in Blood and Urine. L. D. Scott.—p. 17.  
Stimulation and Inhibition of Connective Tissue in Mice Following Injection of Benzpyrene. J. F. Riley and A. B. Wallace.—p. 24.  
Some Physical Properties of Diphtheria Antitoxic Horse Serums. R. A. Kekwick and B. R. Record.—p. 29.  
Quantitative Studies on Serologic Reactions of Some Plant Viruses and of a Pea Nodule Bacterium (*Rhizobium Leguminosarum*). A. Kleczkowski.—p. 44.

**British Journal of Radiology, London**

14:115-146 (April) 1941

- Radiologic Aspects of Investigation into Relationship of Chronic Iridocyclitis, Uveoparotitis and Tuberculosis. E. R. Williams.—p. 116.  
Optimal Combination of Film and Fluorescing Screen for Use in Indirect Radiography. B. Stanford.—p. 128.  
Increasing Density of Renal Shadow During Excretion Urography: Sign of Acute Urteric Obstruction. S. Nowell.—p. 138.  
Limitations of Biopsy in X-Ray Therapy. F. Roberts.—p. 144.

**British Medical Journal, London**

1:305-348 (March 1) 1941

- Depressive States in War. D. Curran and W. P. Mallinson.—p. 305.  
General Principles of Treatment of Air Raid Casualties. P. H. Mitchiner.—p. 309.  
\*Experimental Human Scurvy: Notes on Remarkable Study Reported by Crandon, Lund and Dill. F. W. Fox.—p. 311.  
Serum Cholesterol and Irradiation Sickness. Barbara E. Holmes.—p. 314.  
Abdominal Hyperesthesia in Army Dyspeptics. W. G. Mills.—p. 315.  
Incidence of Scabies and Its Apparent Dependence on Subnormal Intelligence. G. A. Hodgson.—p. 316.

**Experimental Human Scurvy.**—Not only does the production of human scurvy by Crandon, Lund and Dill (in Crandon himself) illustrate the possibilities for isolating the part played by a single vitamin, but the fact that the subject was a healthy human being and not a laboratory animal gives the observations much significance. Fox compares their results with those gained from a study of native mine laborers and finds that the two are complementary. He observed approximately 1,000 healthy men who were on a low but not entirely deficient daily intake of ascorbic acid for seven months. The American investigators made an intensive study of 1 healthy man on a diet devoid of vitamin C for six months. A comparison and combination of the results of the two studies show the following points: 1. Total deficiency failed to produce symptoms of impaired health over a period of three months, during which time the subject was draining his stores of the vitamin. In the author's study a low daily intake gave equally negative results for seven months in individuals having very low initial reserves. 2. In neither case could any increase in capillary fragility be detected, even when frank scurvy developed. 3. With the total or the partial deprivation there was no clinical indication of ill health. 4. There was no indication that vitamin C deficiency leads to anemia. 5. In both investigations the gums remained healthy. 6. Resistance to infection had apparently not been diminished by the reduction or lack of vitamin C intake. 7. Wound healing was not impaired. 8. No less than six months of total deprivation brought about such impairment. 9. Evidently deprivation of ascorbic acid, unless extremely severe and prolonged, does not of itself lead to scurvy when precipitating factors (growth, multiple avitaminosis and infection) are absent. 10. A feeling of languor and incapacity for strenuous work was apparent only after three months of total deprivation; and even part of this may have been accounted for by the associated loss of weight. Similar indications were not observed by the author in his subjects who lived for seven months on low daily intakes. Scurvy did not develop either more quickly or more often among those doing strenuous work. 11. Neither study establishes with any certainty the daily requirements of ascorbic acid neces-

sary to maintain good health. The author's experience indicates that remarkably good health was maintained on 15 mg. or a little more of ascorbic acid. This level is in agreement with that estimated by Kellie and Zilva. The two investigations lend no support to the common assumption that large amounts of the vitamin would improve the general standard of health, though the precarious nature of meager supplies is clearly demonstrated.

**Journal of Laryngology and Otology, London**

55:531-584 (Dec.) 1940

- The Cochlear Nerve and Vascular Theory of Nerve Deafness. N. Asherson.—p. 531.

**Lancet, London**

1:269-302 (March 1) 1941

- Anaerobic Infections and Gas Gangrene. G. T. Mullally.—p. 269.  
\*Elimination of Streptococci from Superficial Wounds by Sulfanilamide Powder. L. Colebrook and A. E. Francis.—p. 271.  
Breech Presentation; 100 Cases. A. Gairdner, Margaret Hadley Jackson and L. N. Jackson.—p. 273.  
\*Sulfathiazole in Treatment of Staphylococcal Infections. G. Melton.—p. 274.

**Elimination of Streptococci from Wounds.**—Colebrook and Francis investigated the effect of local applications of sulfanilamide (and sulfathiazole) on 62 superficial wounds. The 35 patients in this study with these 62 wounds were observed for several weeks. All of them were infected with hemolytic streptococci. Of the patients 32 received sulfanilamide locally only and 3 also by mouth. The local application of sulfanilamide to 21 patients with 33 wounds infected with *Streptococcus pyogenes* resulted in permanent disappearance. The streptococci also disappeared from 10 wounds of 3 patients given sulfanilamide also by mouth. In the 6 recurrences of infection a further course of treatment resulted in the disappearance of the infection. One group C infection was freed of streptococci and healed uneventfully. Group G streptococci of 1 wound disappeared with local treatment only, in another with local and simultaneous oral therapy and in a third, unsuitable for local therapy (compound fracture of the mandible), with oral sulfanilamide only. Four instances of group D infections were found resistant to local treatment with sulfanilamide. Sulfanilamide failed to rid 2 wounds of *Strep. pyogenes*. In the few instances in which sulfathiazole was used it was not as effective as sulfanilamide. Hemolytic streptococci usually disappeared from the wounds within three or four days. Neither sulfanilamide nor sulfathiazole had consistent effects on the staphylococci, *Bacillus proteus* or *Pseudomonas pyocyanea* also present in many of the wounds.

**Sulfathiazole for Staphylococcal Infections.**—Melton discusses results of sulfathiazole treatment in 50 cases of staphylococcal infection, including 11 cases reported previously. Most of the infections were of a severe type (acute osteomyelitis with septicemia, acute osteomyelitis with sterile blood culture, chronic osteomyelitis, carbuncles and staphylococcal pyemia, abscess and pyopneumothorax). In staphylococcal septicemia the drug was of value when given early and in adequate doses. Rapid improvement was attributed to the drug in 5 of the 13 cases in which recovery occurred. In acute osteomyelitis it did not lessen the need for surgical drainage or check the progress of suppuration, but it reduced toxemia. Many of the carbuncles ceased to extend when the drug was begun and the pyrexial period was shortened, but 2 of 5 patients with carbuncle on the upper lip or nose died; both had cavernous sinus thrombosis before treatment was begun. The drug was also found of value after surgical drainage had been instituted in clearing up the toxemia and accelerating the subsidence of the local lesion. Early diagnosis is clearly essential to successful therapy with sulfathiazole, as failure and death occurred only in advanced cases. The action of the sulfonamides on suppurative inflammatory foci is inhibited by the presence of peptones in the pus. Thus abscesses, whether local or metastatic, will prevent successful therapy unless they are accessible to surgical drainage.

**Tubercle, London**

22:33-54 (Feb.) 1941

- Problem of Virulence of Tubercle Bacillus. A. S. Griffith.—p. 33.  
Pulmonary Asbestosis Accompanied by Tuberculosis: Case. H. Hansson.—p. 40.

**Revista Médica de Rosario, Rosario de Santa Fe**

31:1-104 (Jan.) 1941. Partial Index

- \*Neurologic Symptoms of Cerebral Metastases from Pulmonary Cancer. N. Romano and R. A. Eyherabide.—p. 1.  
Hydronephrosis from Vascular Abnormalities. R. J. Taltavull and J. C. Tettamanti.—p. 60.

**Neurologic Symptoms of Cerebral Metastases in Cancer of Lung.**—Romano and Eyherabide emphasize the importance of clinical observations on patients with neurologic symptoms and of roentgen examination of the thorax in the diagnosis of cerebral metastases from bronchopulmonary cancer. In the 10 cases reported by the authors the neurologic symptoms overshadowed the bronchopulmonary symptoms. A diagnosis of bronchopulmonary cancer was made by the clinical and roentgen examinations in all cases but 2 in which bronchopulmonary cancer was found at necropsy. A necropsy was performed in 4 cases. Cerebral metastases may occur in any cerebral zone.

**Wiener medizinische Wochenschrift, Vienna**

90:943-958 (Dec. 7) 1940

- Therapy of Intermittent Claudication. V. Behr.—p. 944.  
\*Present Status of Vitamin E Research and Therapy. W. Herbrand and K. H. Jaeger.—p. 946.  
Did the World War Demonstrate the Necessity of Vascular Suture? H. Wenzl.—p. 948.

**Vitamin E Therapy.**—Herbrand and Jaeger review the present status of vitamin E, paying particular attention to its therapeutic use. They recommend the administration of vitamin E for the duration of pregnancy and lactation. In cases of habitual abortion, medication with vitamin E should begin early. They recommend two intramuscular injections a week, beginning soon after the cessation of the menses and continuing into the seventh month of pregnancy. In the intervals between the intramuscular injection the vitamin is to be given by mouth. The simultaneous administration of progesterone is advisable in cases of habitual abortion. In many cases of hypogalactia the milk secretion can be increased by the administration of vitamin E two or three times a week by intramuscular injection, and daily by mouth. Impaired potency and azoospermia are likewise favorably influenced by vitamin E, even in cases refractory to hormone therapy. The authors recommend simultaneous administration of vitamin E and androgen. In cryptorchism the combined administration of gonadotropic substance and of vitamin E is recommended in order to effect the descent of the testes. Gonadotropic substance is injected daily or every second day and vitamin E is given daily by mouth. This treatment is continued for from two to four weeks. Neuromuscular disturbances, particularly muscular dystrophy, can be noticeably improved by intensive treatment with vitamin E. Injections of the vitamin should be given daily or every other day and in addition the vitamin should be given by mouth.

**Vestnik Khirurgii, Leningrad**

60:1-116 (July-Aug.) 1940. Partial Index

- Roentgenologic Studies of Postoperative Pulmonary Complications. V. P. Tsvetkov.—p. 3.  
The Bettman-Davidson Treatment of Burns. A. E. Norenberg.—p. 9.  
\*Subpectoral Phlegmon. V. R. Noshchinskiy.—p. 18.  
Id. O. N. Nilonova.—p. 32.  
Roentgen Diagnosis of Gas Infection. G. A. Zedgenidze.—p. 41.  
Subcutaneous Injury of the Intestine. G. B. Logvinskiy.—p. 49.

**Subpectoral Phlegmon.**—Noshchinskiy calls attention to the fact that deep subpectoral phlegmon frequently evades recognition. Thus, of the 72 cases admitted to his clinic, 12 were directed with the diagnosis of grip, 2 with that of pneumonia, 1 as rheumatoid arthritis, and 1 as acute inflammation of the shoulder joint. The portal of entry was definitely established in 38. These are to be looked for in superficial inflammatory processes of the upper extremity, most frequently in the fingers. The condition is essentially a grave type of an acute inflammatory process of the lymph nodes and the cellular tissue of the axilla. The local symptoms are slight and are obscured by the general septic condition. Certain tender points are present, in the author's experience, early in the course of the infection and are important aids to diagnosis. These are

a point of tenderness just below the clavicle 1 cm. inside the anterior axillary line and another in the second intercostal space lateral to the midclavicular line. There are tenderness and spasm of the pectoralis major muscle and limitation of movements of the shoulder joint. Treatment consists of early and radical incision along the lower border of the pectoralis major, followed by incision of the pectoral and the coracoaxillary fascias in order to expose the deep subpectoral space.

**Acta Medica Scandinavica, Stockholm**

106:1-238 (Jan. 30) 1941. Partial Index

- Tube Treatment of Chronic Gastric and Duodenal Ulcers. K. Secher.—p. 1.  
Therapeutic Measures in Osteomalacia and Control of Their Efficiency. J. H. Vogt.—p. 16.  
\*Electrocardiographic Studies in Scarlet Fever. E. Roelsen.—p. 26.  
Practical Ruler for Frequency Estimation in Electrocardiogram. M. Kobra.—p. 57.  
Behavior of Takata Reaction in Myeloma. T. Hafström.—p. 61.

**Electrocardiographic Studies in Scarlet Fever.**—Roelsen made electrocardiographic studies of 216 scarlet fever patients in order to determine whether the cases accompanied by arthralgia were more frequently complicated by myocardial changes than those without arthralgia. There were 9 patients among the group whose electrocardiographic changes were explainable on other preexisting grounds. Changes in the electrocardiograms were found in 65 of the 207 remaining patients. This substantiates the previous observation that such changes were frequent in scarlet fever. The changes occurred somewhat more frequently in the arthralgic group (in 39 of 108 patients) than in the group (in 26 of 99) without arthralgia. The changes were delayed auriculoventricular conduction in 20 cases, Wenckebach arrhythmia in 1, modal rhythm and changes of the ST interval and of the T deflections in 49. A few instances of an abnormal archlike course of ST<sub>2</sub>, extrasystole, deep Q<sub>3</sub>, left sided preponderance, deep S<sub>1</sub> and inverted P<sub>2</sub> were encountered. The changes appeared virtually at all times during the course of the disease. The changes, as a rule, were transitory, but in isolated cases they persisted for several months. The gravity of the patient's condition on admission scarcely afforded a clue with regard to the eventual appearance of changes in the electrocardiogram, while the rise of temperature may in some degree be premonitory of it. The ordinary complications were of fairly equal incidence in patients with and without electrocardiographic changes. In general the changes are not attended by subjective heart symptoms or objective signs of congestive heart failure. Auscultation frequently revealed atypical systolic murmurs and, in isolated cases, a slight dilatation. The electrocardiographic changes and the auscultatory signs did not parallel each other. The severe, somewhat more persistent changes are probably due to pathologic changes in the myocardium. The slight or transitory changes are possibly due to a purely toxic influence on the cardiac muscle or to an allergic reaction. For the present it will probably be correct to qualify the changes as a mere myocardial involvement (verified by electrocardiography). On comparing the electrocardiographic changes observed in scarlet fever with those found in rheumatic fever, points of resemblance between the two are seen. However, the electrocardiographic changes in rheumatic fever are usually far more serious and persistent than those in scarlet fever. Yet the difference in the two diseases is probably only quantitative. The greatest difference between the cardiac complications attending the two diseases is the frequent occurrence of endocarditis in rheumatic fever and its rarity in scarlet fever, when it is merely an expression of "overlapping" between the diseases. The electrocardiographic changes are evidently not specific for either disease. During recent years similar electrocardiographic changes have been reported in a number of different infectious diseases: influenza, pneumonia, typhus and tonsillitis. Diphtheria often entails pronounced myocarditis, in many cases with severe, persistent and pronounced electrocardiographic changes. If changes are not detected in convalescents after infectious diseases, they will often appear after physical exercise tests. Electrocardiography has added to empiricism an objective criterion.



## Book Notices

**Economy in the Use of Drugs in War-Time.** With an Appendix Giving a List of Drugs of Which Production Within the British Empire Should be Encouraged. Medical Research Council: Therapeutic Requirements Committee: War Memorandum No. 3. Paper. Price, 10 cents; 3d. Pp. 18. New York: British Library of Information; London: His Majesty's Stationery Office, 1941.

The problem of economy in the use of drugs in war time is of major importance when a restriction of importations arises or appears imminent. The Therapeutic Requirements Committee was appointed in September 1939 by the Medical Research Council in consultation with the Ministry of Health to "consider the question of essential drugs to be used under war conditions and to give guidance to those responsible for insuring the supply of these." The list of drugs included in the booklet is based on the British Pharmacopeia 1932, including Addenda 1936 and 1940, and on the British Pharmaceutical Codex 1934 and are classified as follows:

- A. Drugs which are at present either
  1. Regarded as essential or
  2. Readily available
- B. Drugs which are essential for certain purposes but not for others and in the use of which strict economy should be observed.
- C. Drugs which are not essential and do not justify importation or manufacture for home use in war time.

Approximately five hundred drugs are classified with a substitute or equivalent given wherever possible, and they are subjected to pertinent remarks as to control, countries of origin and the possibility of production in the United Kingdom and in the British Empire. The omission of proprietary names wherever possible indicates that the use of nonproprietary medicaments is favored.

An appendix lists the drugs which the committee recommends for production within the British Empire and may interest those in this country who are directing their attention toward the domestic sources of botanicals. The United States is unique in its possession of varied soils and climate, and the possibilities of home production of botanicals have not yet been fully explored. As during the World War period, the increase in prices may do much to offset the cost of production and marketing, thus favoring further explorations in this interesting problem of home production and substitution.

**Williams' Obstetrics: A Textbook for the Use of Students and Practitioners.** By Henry J. Stander, M.D., F.A.C.S., Professor of Obstetrics and Gynecology, Cornell University Medical College, New York. Eighth edition. Cloth. Price, \$10. Pp. 1,401, with 704 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1941.

The most striking thing about the new edition of Williams' classic book is its size. The present edition contains one thousand, four hundred and one pages (the seventh edition contained one thousand, two hundred and sixty-nine pages). Some of this space could have been curtailed. About one hundred and sixty pages are devoted to lists of literature and sixty-two pages are taken up by the index. Eight closely printed pages in small type are given over to the theories of the origin of eclampsia. Likewise ninety-six pages are allotted to the section on contracted pelvis. This is too long, especially in view of the fact that many of the abnormalities discussed and illustrated are extremely rare. The section on the toxemias of pregnancy occupies eighty-one pages, including twelve pages of references. Perhaps the sections on contracted pelvis and toxemias are large because Williams was particularly interested in the bony pelvis and Stander has for many years devoted considerable effort to the study of the toxemias of pregnancy.

The book shows evidence of extensive rewriting. Chapters have been rearranged and three new ones added on diseases and abnormalities of the newborn child, classification of abnormal and contracted pelvis and sudden death and maternal mortality. In the section on the mechanism of labor the author has made changes to conform with the recent roentgenologic observations of Caldwell, Moloy and d'Esopo and Thoms. Likewise a new classification of contracted and abnormal pelvis is proposed and a good deal of space is devoted to roentgenologic pelvimetry, which is discussed in detail. In the section on the toxemias of pregnancy, the new classifica-

tion of the American Committee on Maternal Health is included. The chapter dealing with the urinary tract was rewritten, and special consideration was given to the use of the sulfonamide group of drugs for the treatment of pyelitis. Likewise the chapter on endocrinology was rewritten to include the newer developments in this field. In the discussion of the treatment of puerperal infection the newer concepts of chemotherapy are taken into consideration. The chapter on amnesia, analgesia and anesthesia in labor deals with practically all the drugs and gases which are used during labor, and the author even mentions hypnotism. Stander is now employing direct infiltration more often than he has in the past. In the resuscitation of newborn babies he prefers special apparatus for the administration of carbon dioxide and oxygen rather than the simpler tracheal catheter. Throughout the book the recommendations made concerning treatment are just as conservative as they have been in the past.

As in previous editions the illustrations are beautiful and highly instructive. A large proportion of the illustrations are entirely new and were made by Elizabeth Brödel.

This book, which was originally and is still based principally on Williams's extensive experience in obstetrics, is now brought down to date by the addition of Stander's laboratory and clinical experience in this field. The book is a tribute to the faithfulness and ability of Stander and because of this it remains one of the leading textbooks in obstetrics in the world.

**The Extra-Ocular Muscles: A Clinical Study of Normal and Abnormal Ocular Motility.** By Luther C. Peter, A.M., M.D., Sc.D., Consulting Ophthalmologist in the Rusli Hospital for Consumption and Allied Diseases, Philadelphia. Third edition. Cloth. Price, \$4.50. Pp. 368, with 152 illustrations. Philadelphia: Len & Feglger, 1941.

The first edition of this book was reviewed in these pages on April 14, 1928 and the second edition on Oct. 24, 1936. The demand for a third edition thus indicated speaks more for the caliber of the work than can the few hundred words allowed to a review. There hasn't been much change in our knowledge of the anatomy and physiology of the muscles during the fractional part of a generation covered by the span of these three editions. The author's knowledge of various phases of heterophoria has not changed materially, but the general ophthalmologist is beginning to know more about the subject, and consequently the logical sequence in which this chapter is written will undoubtedly have wider application. In the review of the last edition it was pointed out that the author of the book states unequivocally that the amblyopia of a squinting eye is due to disuse. This view is not universally held. The major changes in this edition are an enlargement by twelve pages, the addition of eleven illustrations, and a slight rearrangement of textual matter. The book still deserves the closing phrase of the reviews of the two previous editions: The text is excellent and practical, the illustrations are good and really illustrative, and the book making and binding are satisfactory. This is a book every ophthalmic student and practicing ophthalmologist can read with profit and pleasure.

**Electrocardiography in Practice.** By Ashton Graybiel, M.D., Instructor in Medicine, Courses for Graduates, Harvard Medical School, Boston, and Paul D. White, M.D., Lecturer in Medicine, Harvard Medical School. Cloth. Price, \$6. Pp. 319, with 272 illustrations. Philadelphia & London: W. B. Saunders Company, 1941.

The important role that electrocardiography is coming to play in clinical medicine is exemplified by the rapid succession of books on electrocardiography, of which this one by Graybiel and White is the most recent. It follows the plan already established in several preceding books of presenting the electrocardiograms on one page with their description and the clinical story of the patient on whom they were taken on the opposite page. Of the books of this style this is probably the best. The format is excellent and the illustrations are beautifully reproduced. The book is divided into two parts. In the first the authors present a running account of the normal and abnormal electrocardiograms in various circumstances illustrated with one hundred and forty-two electrocardiograms. In the second part they present a series of one hundred and thirty unknown electrocardiograms together with their interpretations. This is not a textbook, as the authors point out, but rather a guide in the practice of electrocardiography. The theory of the electrocardiogram is presented superficially and not entirely

accurately. The importance of the newly established chest leads is not sufficiently stressed, and the description of the chest leads is incomplete. Undue emphasis placed on the electrocardiographic appearances in various diseases in which the changes are not specific makes it more difficult for the reader unaccustomed to electrocardiography to become properly oriented as to its importance in disease. This book exemplifies the tendency prevalent among some electrocardiographers to read the record as a supplement of the clinical picture rather than to read the electrocardiogram first objectively and then to make the correlation. It would have been better to begin with the electrocardiographic description and objective interpretation before giving the clinical story and the correlation between the electrocardiogram and the latter. There are a number of other errors of a minor sort which need not be detailed. On the whole this is an excellent book, and the reader will find that its perusal will help him to appreciate the manner in which the Boston school interprets electrocardiograms and should therefore be of considerable assistance to him in dealing with his own records.

**A Manual of Embryology: The Development of the Human Body.** By J. Ernest Frazer, D.Sc., F.R.C.S., Professor of Anatomy in the University of London, London. Second edition. Cloth. Price, \$9. Pp. 523, with 282 illustrations. Baltimore: William Wood & Company, 1940.

As the reaction of students to a textbook is frequently different from that of their teachers, the reviewer has given this book to several of his advanced students for examination. They agree that complex developmental processes are described clearly in it; one student praised the number of three dimensional drawings but felt that they would be better with more labels.

The reviewer has found this to be a readable, accurate but relatively elementary presentation of mammalian and especially human embryology. The gross and topographic aspects of embryonic development are stressed. The book lacks the emphasis on the microscopic appearances during development which are found in most of the American textbooks. The book would be improved with more references to the literature. There are two opinions on this question; the reviewer happens to feel that, as long as the content of a scientific book is subject to revision through continued observation and experiment, at least leading references should be included for several reasons: 1. The presence of the reference may stimulate the student to read the source material. 2. It shows the instructor the basis for some of the opinions expressed implicitly or explicitly in the text. 3. Most importantly, the failure to give references—and contradictory references at that—too often is likely to induce in the student a feeling of dogmatism about the material being studied. This is highly undesirable in all the biologic disciplines, including embryology. One of the main purposes of a textbook should be the inculcation of how little is known in the mind of the student. There is probably no better way of doing this than by the presence of numerous references to opposing points of view. Some teachers will object to this, as they believe that the student has a sufficiently heavy task in learning the "what" and should not be bothered by the "who thought so" and who did not.

A suggestion for future revisions of this and other textbooks of embryology: The presentation of embryology from a descriptive point of view is insufficient. A modern presentation must include many of the important and dramatic accomplishments of experimental embryology.

**Undersøgelser over den tilsyneladende primære exsudative Pleuritis Klinisk med særligt Hensigt paa Prognosen.** Af Erik Strandgaard. [Studies on Clinical Aspects of Seemingly Primary Exudative Pleurisy, with Special Consideration of Prognosis.] Denne Afhandling er af det lægerlidskabelige Fakultet antaget til offentlig at forsvares for den medicinske Doktorgrad København, 1940. Paper. Price, 15 Danish kroner. Pp. 153, with 10 illustrations. Copenhagen: Ejnar Munksgaards Forlag, 1940.

This is an academic doctor's thesis in Danish with summaries in German and English. The earlier literature on problems of pleurisy is reviewed and a detailed account is given of some 986 hospital cases of apparently primary exudative pleuritis and of the results of the follow-up and reexamination of the surviving patients some six years after the primary attack. A good general picture of the disease is given as it occurs in the population of Copenhagen, with special emphasis on the prog-

nosis. In 309 cases the pleuritis was unquestionably tuberculous and most of the remaining save 14 also seemed to be tuberculous. The thesis embodies the outcome of thorough, well planned work for several years and is a valuable contribution to the clinical study of primary exudative pleuritis.

**Practical Orthoptics in the Treatment of Squint (Including Heterophoria, Paralytic Squint and Ocular Torticollis).** By Keith Lyle, M.A., M.D., M.Chir., Assistant Ophthalmic Surgeon, King's College Hospital, London, and Sylvia Jackson, Senior Orthoptist, Royal Westminster Ophthalmic Hospital, London. Foreword by Charles Leonard Glimblott, M.A., M.D., M.R.C.P., Surgeon, Royal Westminster Ophthalmic Hospital, London. Second edition. Cloth. Price, \$4. 15s. Pp. 341, with 101 illustrations. Philadelphia: Blackiston Company; London: H. K. Lewis & Co., Ltd., 1940.

The first edition of this excellent practical manual for orthoptic students appeared in 1937. With the appearance of the second edition, which was ready for publication at the outbreak of the war in September 1939, the subject has been thoroughly brought up to date. Much additional matter has been included which has increased the size of the book. A chapter is added on the etiology of strabismus taken largely from Chavasse's revision of Worth's Squint. A new chapter on adult cases of squint has been added, and much additional information has been included in the chapters on paralytic squint and on ocular torticollis. In 1937 the authors recommended that an orthoptic board should be devised to examine and certify nonmedical orthoptic technicians. In 1939 such a board was formed in this country and is now functioning efficiently with yearly examinations for technicians. The orthoptists of the principal schools have outlined a standard of cure in order to facilitate the comparison of their results. It has been incorporated in this edition and has been carefully adopted in the ruling of the author's results. An appendix is added giving an outline in tabular form of all cases treated and investigated in the orthoptic department of the Royal Westminster Ophthalmic Hospital in the course of the year 1938. This study gives some idea of the incidence of the different types of squint and heterophoria, the length of treatment received and the results to be expected. The book making and illustrations adhere to the high standard set by the first edition. Not only is this book an excellent manual for orthoptists, but it can be highly recommended for all practicing ophthalmologists.

**Your Career in Nursing.** By Cecilia L. Schulz, R.N. Cloth. Price, \$2. Pp. 205, with 8 illustrations. New York & London: Whitteley House, McGraw-Hill Book Company, Inc., 1941.

This book contains chapters on nurses and nursing—a panoramic view, what it takes, nursing schools—and nursing schools, and six other equally important well selected subjects. It is written especially for those who are contemplating nursing as a career. It gives a good idea of what nursing is like. A vein of well directed humor helps the reader to get the point clearly. The information given throughout the book is reliable. A person who is considering nursing for a career will be assisted in making up her mind by reading this book.

**Testing Respiratory Protective Equipment for Approval.** By H. H. Schrenk, Chief Chemist, Health Division, Bureau of Mines, Pittsburgh. United States Department of the Interior, Bureau of Mines. Information Circular 7130. Paper. Pp. 9. Washington, D. C., 1940.

When the U. S. Bureau of Mines was established in 1910 it was provided that among its duties were to be investigations "in relation to the safety of miners and the appliances best adapted to prevent accidents . . . and from time to time to make reports of investigations." The information circular is one of seven thousand, one hundred and thirty such reports. It first distinguishes and defines the various forms of atmospheric contamination occurring in mines, such as gases, toxic and inert (oxygen deficiency); dusts, fumes, mists formed by disintegration, and fogs formed by condensation. It then describes the various forms of protective devices, such as gas masks specially arranged against each atmospheric contaminant; self-contained oxygen breathing apparatus; hose masks, and helmets for protection against abrasives and blasting. The requirements established by the bureau for each type of equipment are described and the tests which each must meet before gaining the approval of the bureau. Such reports are a public service of a high order; they have led to steady improvement in the quality of protective devices and thereby to the saving of life.

## Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

### ARMY SERVICE AFTER ACUTE GLOMERULAR NEPHRITIS

*To the Editor:*—A man aged 30, who has recently recovered from an attack of an acute diffuse glomerular nephritis following pharyngotonsillitis, desires to volunteer for service in the army. During the six weeks of hospitalization the patient showed the usual urinary conditions, slight azotemia and mild hypertension. At present (four weeks since his discharge from the hospital) the patient feels quite well apart from occasional headaches; his urine shows no abnormalities; however, he does have persistent, mild hypertension, the blood pressure varying between 130 systolic and 90 diastolic and 150 systolic and 100 diastolic. Would service in the army, with its necessary exposure to cold and damp, be detrimental to my patient's future health? Would such a patient be deterred from the Selective Service Act or classified as "disabled?"

M.D., New York.

*ANSWER.*—Following an attack of acute glomerular nephritis there is a prolonged period of undetermined length but certainly lasting many months or years—the so-called latent period—in which all active signs and symptoms of the disease may have disappeared but during which the patient still remains susceptible to the remote effects of his former disease. It is during this period that the eventual course of the disease is determined; that is, whether the latent stage progresses successfully to a healed condition or whether it tends to become active and the patient suffers either hypertensive cardiovascular disease or a recurrence of nephritis with the possibility of malignant hypertension.

For these reasons the patient should be given every consideration of a period of eighteen to twenty-four months following the termination of all active signs of nephritis. This means refraining from fatigue or undue exposure to chilling, the avoidance of rapid changes of temperature and the use of a diet adequate in caloric value as well as in the supplemental vitamin content.

It is possible that such a diet might be obtained in the army, but probably the other factors would be lacking, especially since the patient mentioned has a moderate elevation of blood pressure. Service in the army would be detrimental, and he should be classified as deferred until the final course of his disease is known. Naturally decisions vary according to draft boards, and with these facts in mind no person in this stage should be allowed to volunteer, nor should he be subject to the draft.

### BLOOD TYPE DOES NOT CHANGE

*To the Editor:*—About nine months ago I was typed for a blood transfusion, which was given with no ill effect to the patient. At that time my blood was in group O. Since that time it has continuously failed to match with that of several patients also in group O. Recently I had my blood retyped and now it is type A. I have heard that changes in the blood grouping at a person have occurred. I should appreciate information on the subject and references. I have been unable to obtain any satisfactory explanation.

M.D., Canal Zone.

*ANSWER.*—The blood groups do not change, remaining constant regardless of age, disease or environment (Wiener, A. S.: Blood Groups and Blood Transfusion, ed. 2, p. 139). In every reported instance of a supposed change in blood grouping the possibility of a mistake in grouping could not be excluded. In the hands of persons who are experienced in blood grouping, "changes" in blood groups do not occur. The fact that the inquirer's blood continuously failed to match with that of other patients of group O shows that the original grouping was wrong. There are several possible explanations for the successful transfusion, despite the original error in blood grouping. First, if a double error is made and patient and donor both belong to group A but have been incorrectly grouped as O, no harm would result. Secondly, transfusions of incompatible blood are occasionally symptomless (Wiener: Blood Groups and Blood Transfusion, p. 91). Group A offers a special pitfall in grouping which seems not to be generally known, namely the existence of two sorts of A agglutinin,  $A_1$  and  $A_2$ . Weak grouping scrums may be strong enough to agglutinate  $A_1$  cells but may fail to clump blood of subgroup  $A_2$ , and in that way blood of the latter subgroup can be mistaken for group O.

### IMPREGNATION AFTER VAS LIGATION

*To the Editor:*—A patient had bilateral vas ligations in 1935. He and his wife now want another child. An unsuccessful attempt has been made to reunite the vas on one side. Kindly send instructions or literature on testicular aspiration and insemination. They do not care to use a donor other than the husband.

M.D., Kentucky.

*ANSWER.*—The operation to restore the lumen of the vas after vasectomy is rarely successful. The more thorough the original operation was, the more difficult it is to restore the lumen and the more uncertain is the result.

The procedure of producing impregnation of the wife by injecting into her uterus fluid obtained by aspiration of the husband's testes is almost universally a failure. The procedure works in animals on which one can use a large trocar but fails in the human being, on whom one must employ a rather fine aspirating needle with which relatively few spermatozoa (certainly less than one hundred) can be obtained.

Huhner (The Diagnosis and Treatment of Sexual Disorders in the Male and Female Including Sterility and Impotence, ed. 2, Philadelphia, F. A. Davis Company, 1939, p. 25) has followed this procedure in a number of cases but without any successful results. Rohlleder, sexologist, of Leipzig at one time reported a successful result but later on discovered that the wife had used this occasion to indulge in extramarital coitus, the husband believing that the child was the result of the artificial impregnation. Other investigators likewise have failed to obtain any results. However, Walker (Male Disorders of Sex, London, Jonathan Cape, 30 Bedford Square, 1930, p. 177) mentioned a successful artificial insemination done by C. H. Mills, a London surgeon, but gives little detail. Possibly the Hagner operation of epididymovasostomy may be tried in this case, as it is at times successful in pathologic closure of the tubes as a result of previous gonorrheal epididymitis.

### GASTROINTESTINAL HEMORRHAGE AND CARBON MONOXIDE POISONING

*To the Editor:*—Recently a woman reported for examination because of gastrointestinal hemorrhage following exposure to carbon monoxide. She had some distress about thirty or forty minutes after meals. She was unable to say whether alkalis or food relieved the pain. The roentgenologist could find no evidence of any lesion in the gastrointestinal tract. Could the exposure to carbon monoxide be responsible for tarry stools from a lesion too small to demonstrate with the roentgen ray and if so what is the prognosis?

A. A. Skemp, M.D., La Crosse, Wis.

*ANSWER.*—This query fails to provide essential information as to the extent of carbon monoxide asphyxiation. If it may be assumed that actual and somewhat prolonged unconsciousness from carbon monoxide occurred, small gastrointestinal hemorrhages shortly thereafter might arise. This is more likely in elderly persons. Such hemorrhage results from direct injury to the capillaries and other small blood vessels of the gastrointestinal tract. If asphyxiation persisted for one hour or more, such minor hemorrhage is not a rarity, but if the carbon monoxide injury was trivial, hemorrhage is not to be expected. In any event, damage is transient and the prognosis with regard to gastrointestinal hemorrhage is good. If tarry stools or other evidences of gastrointestinal tract hemorrhage persist, a cause other than carbon monoxide should be sought.

### AGGLUTININS AFTER TYPHOID VACCINATION

*To the Editor:*—What is the significance of positive typhoid agglutinins when the patient has had typhoid vaccinations within the past four or six months? After five months is an agglutination of 1:640 unusual? Would a lapse of two weeks from the time the last injection was given be sufficient time to give an agglutination titer of 1:120 in the O antigen?

H. S. Hickman, M.D., Fort Lewis, Wash.

*ANSWER.*—Both H and O agglutinins are formed by man in response to immunization against typhoid. (It is now well known that earlier statements to the effect that O antibodies are not formed are incorrect.) The H titers are generally relatively high, almost always over 1:500 and frequently well over 1:1,000 or 1:1,500. These titers fall off rapidly, and by six months after immunization a titer of 1:1,000 is not common, but they may persist at moderate levels, i. e. 1:50 to 1:250, for a number of years. The maximum O titers are much lower, usually 1:80 to 1:320 and rarely as high as 1:640. They fall off even more rapidly than the H titers; as a rule they are only moderate by the end of six months, perhaps 1:20 to 1:100. At the end of a year many persons show no agglutination at 1:20, although in others low titers may persist for several years. The immunologic response, as measured in terms of H and O agglutinins, is then highly variable both as to titers attained and as to their persistence.

In the case of inoculated persons the diagnostic value of agglutination is by no means clear. Felix has urged that O agglutination is the more valuable because of the more rapid disappearance of the somatic agglutinins, but this is not well established. Similarly, the extent to which the amnestic reaction occurs in febrile conditions is not definitely known; some data suggest that it is significant, while others do not. In spite of this there is some evidence that the "agglutination curve," obtained by repeated agglutination tests during the course of the disease, may have diagnostic value. In general, any attempt to set up arbitrary agglutinin levels as "diagnostically significant" confuses rather than clarifies the issue.

An H agglutinin titer of 1:640 five months after immunization is not unusual.

A lapse of two weeks after the last injection is ample to give an O titer of 1:120. For example, Mudd (*J. Immunol.* 23:81 [July] 1932) has observed that ten days after the third injection of typhoid vaccine the O titer varied from 1:80 to 1:320.

#### MIXED TUMOR OF MOUTH

To the Editor:—Can you describe the recognized treatment for an extensive mixed tumor springing from the mucoas membranes covering the superior maxilla? This tumor has been subjected to examination by a competent pathologist and was diagnosed as a mixed tumor. The tumor has eroded the mucoas membranes of the entire roof of the mouth and has invaded the right antrum. The tissue subjected to examination contained cartilage and connective tissue cells, fully differentiated, and considerable stroma. On gross inspection the mucoas membranes covering the hard and the soft palates are completely eroded to within one-fourth inch (0.6 cm.) of the gums. There is a grayish pink ulcerated base with islands of necrosis. The tissue feels rubbery but did not bleed easily when specimens were taken for biopsy. Beyond the ulcerated area the mucoas membrane is pushed forward by the tumefaction beneath, but there is no fluctuation—only the rubbery, indurated sensation on pressure. Kahn and Wassermann tests on two different occasions have given negative results. The duration of the lesion has been about two years, and it is gradually growing larger.

M.D., New York.

ANSWER.—The lesion described in the question is probably a mixed tumor of aberrant salivary glands. From the description the tumor is apparently extensive. It is not possible to make a definite statement on the operability of such a lesion without a careful study of the patient, the roentgenograms and the microscopic slides. Since the right antrum is already invaded, it would seem that the lesion is in all probability inoperable. Intensive irradiation should be considered. If the floor of the antrum is already destroyed, complete sterilization of the lesion even by adequate irradiation may not be possible; in that event a palliative result may be expected. Although these tumors have generally been regarded as radioresistant, complete sterilization has been obtained recently by the use of more intensive irradiation than has hitherto been employed.

#### PHOTOGRAPHIC CHEMICALS AND BLEEDING GUMS

To the Editor:—Please advise if contact with any of the following chemicals used in the photographic industry is known to cause inflamed, spongy, bleeding gums: paraphenylenediamine, metol, hydroquinone, diethylene glycol, sodium carbonate, potassium bromide, sodium sulfite, glacial acetic acid and ammonia. I would appreciate references.

J. S. Abrams, M.D., Chicago.

ANSWER.—All or nearly all of the substances listed are cutaneous irritants, and a few are outstanding in this respect. Further, some of the chemicals mentioned are known to be irritants of the conjunctiva and the membranes of the respiratory tract. None are known to attack the gums in a specific or solitary manner, although damage to the gums in the presence of irritation to the conjunctivas or to nasal and pharyngeal membranes would not be remarkable. Of course if any of the chemicals specified are utilized in retouching work involving the objectionable practice of pointing a brush in the mouth the situation would be different. Apart from the chemicals listed, it may be noted that at least two unlisted ones are capable of producing inflamed, bleeding gums. These are mercury compounds and benzene, both applied in some aspects of photographic work. Mercury vapors in the atmosphere may be determined by means of the selenium sulfide apparatus as described by Nordlander (*Indust. & Engin. Chem.* 19:518, 1927). Any quantity of mercury in excess of 1 mg. in 10 cubic meters of air may prove the source of injury and the cause of the gingivitis. Benzene vapors are determined with greater difficulty, but any repeated use in photographic work should prompt suspicion of poisoning with benzene. On examination of the blood, leukopenia and anemia are suggestive. The carrying out of urine sulfate tests as described by Yant and others (*J. Indust. Hyg. & Toxicol.* 18:349, 1936) may be of value.

The health of workers in photographic darkrooms is frequently impaired by the lack of proper ventilation, the absence of sunlight and exposure to mixed vapors and gases usually present. It is possible in the present instance that general disease of a systemic nature may be related to the disorder described instead of its causation being sharply connected with any one chemical employed at work.

#### TRUSS FOR HERNIA

To the Editor:—A man aged 55, whose general condition is such that operation presents risks, has a pantaloon type hernia on the right side with one sac presenting through the femoral ring and the other protruding as a direct inguinal hernia. Both are rather large, and when the inguinal region is compressed the femoral region bulges and vice versa. This condition is unique in my experience, and I am having great trouble in finding and fitting any type of apparatus that will properly support the two hernias at the same time and will allow sitting and rising and operating an automobile. Can you advise me as to a satisfactory support for this condition?

M.D., Virginia.

ANSWER.—It is difficult, if not impossible in some instances, to differentiate an inguinal from a femoral hernia. In order to fit a patient properly with a truss one must decide whether the condition is a double inguinal hernia (direct and indirect) or an inguinal and a femoral hernia together. A femoral hernia turns up over Poupart's ligament and lies in the region of the external ring and hence is easily confused with an inguinal hernia. However, if the hernia can be reduced it will at once be apparent what the condition is, and if the hernia cannot be reduced a truss should not be applied.

To retain a bifid hernia of this nature, the best method is a well made support with correct thigh control for the femoral hernia. Into this support two laparotomy pads must be correctly placed so as to give uniform pressure in all the actions of the patient. It is necessary to give measurements as for an abdominal support, and measurements of thigh at crotch, also how large a protrusion exists when both hernias are out.

#### PLASTER CASTS IN TREATMENT OF BURNS

To the Editor:—Please give me any information possible on the use of plaster casts in the treatment of burns. C. B. Thomas, M.D., Norwalk, Ohio.

ANSWER.—The use of plaster casts has been advocated in the treatment of burns, and successful results have been reported. A plaster cast is applied after using cod liver oil ointment; this treatment is reported in the German literature (Wichmann, F. W.: Unguentolan [cod liver oil ointment] and Plaster Casts in the Treatment of Burns, *Zentralbl. f. Chir.* 66:655 [March] 1939). One of the several advantages of the plaster dressing is covering the wound, putting the part at rest and minimizing the dressings, which may result in secondary infection.

A mixture of cod liver oil and petrolatum is applied to the burned area and a glazed cotton dressing placed over the mixture and then a light plaster cast applied, immobilizing the joint above and below. When there is the possibility of contracture, the extremity may be overextended and kept overextended for a period of three weeks. The light plaster casts applied are removed at the end of one week, at which time there may be present a foul odor. The mixture of cod liver oil and petrolatum is then reapplied in addition to the application of a light plaster dressing. This type of treatment has also been reported by Alfonso (Zino Method of Immobilization in Plaster Casts, *Arg. brasil. de cir. e ortop.* 6:302 [Sept.-Dec.] 1938).

#### TRANSMISSION OF HEART SOUNDS TO CHEST WALL

To the Editor:—What condition would cause the heart sounds and systolic murmur at the aortic valve area to be distinctly transmitted over the whole right side of the chest? Vocal fremitus is also increased on the right side. The percussion note is not much different from that on the left side.

H. M. Metcalf, M.D., Hendrysburg, Ohio.

ANSWER.—The question does not state whether cardiovascular disease has been ruled out. An aortic aneurysm might produce the condition described. It is not likely that aortic valve disease or simple aortitis would be associated with increased vocal fremitus. If cardiovascular disease can be ruled out one must consider any cause that would produce consolidation or compression of the lung with impingement on the base of the aorta. The heart sounds and the vibrations of the aorta might be widely transmitted along a solid medium. Such a cause might be mediastinal glands or a tumor. Extensive fibrosis of the lung would serve. Tumors of the lung properly placed must be considered, as must tumor of the pleura. Pleural adhesions are possibilities. A congenital malformation, such as coarctation of the aorta, is possible but unlikely. Roentgenograms of the chest taken at various angles should prove helpful.

## JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, JANUARY-JULY, 1941

Titles have been listed or Abstracts made of important articles in the following journals in the Current Literature Department of THE JOURNAL during the past six months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to members of the American Medical Association for a period not exceeding three days. Three journals may be borrowed at a time. No journals are available prior to 1931. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Thus most of these journals are accessible to the general practitioner.

- Acta medica Scandinavica. Stockholm.  
Acta ophthalmologica. Copenhagen.  
Acta pathologica et microbiologica Scandinavica. Copenhagen.  
American Heart Journal. St. Louis.  
American Journal of Cancer. New York.  
American Journal of Clinical Pathology. Baltimore.  
American Journal of Digestive Diseases. Huntington, Ind.  
\*American Journal of Diseases of Children. A. M. A., Chicago.  
American Journal of Hygiene. Baltimore.  
American Journal of the Medical Sciences. Philadelphia.  
American Journal of Obstetrics and Gynecology. St. Louis.  
American Journal of Ophthalmology. St. Louis.  
American Journal of Orthodontics and Oral Surgery. St. Louis.  
American Journal of Orthopsychiatry. Menasha, Wis.  
American Journal of Pathology. Boston.  
American Journal of Physiology. Baltimore.  
American Journal of Psychiatry. New York.  
American Journal of Public Health. New York.  
American Journal of Roentgenol. and Radium Therapy. Springfield, Ill.  
American Journal of Surgery. New York.  
American Journal of Syphilis, Gonorr. and Venereal Diseases. St. Louis.  
American Journal of Tropical Medicine. Baltimore.  
American Review of Tuberculosis. New York.  
Anais brasileiros de ginecologia. Rio de Janeiro.  
Anales de la Sociedad de puericultura de Buenos Aires.  
Anesthesiology. New York.  
Annales pediatriques. Basel.  
Annals of Internal Medicine. Lancaster, Pa.  
Annals of Otolaryngology and Laryngology. St. Louis.  
Annals of the Rheumatic Diseases. London.  
Annals of Surgery. Philadelphia.  
Archiv für japanische Chirurgie. Kyoto.  
Archiv für Kinderheilkunde. Stuttgart.  
Archiv für klinische Chirurgie. Berlin.  
Archiv für Kreislaufforschung. Dresden.  
\*Archives of Dermatology and Syphilology. A. M. A., Chicago.  
Archives of Disease in Childhood. London.  
\*Archives of Internal Medicine. A. M. A., Chicago.  
\*Archives of Neurology and Psychiatry. A. M. A., Chicago.  
\*Archives of Ophthalmology. A. M. A., Chicago.  
\*Archives of Otolaryngology. A. M. A., Chicago.  
\*Archives of Pathology. A. M. A., Chicago.  
Archives of Physical Therapy. Chicago.  
\*Archives of Surgery. A. M. A., Chicago.  
Archivos argentinos de pediatria. Buenos Aires.  
Archivos argentinos de fisiologia. Buenos Aires.  
Archivos de pediatria del Uruguay. Montevideo.  
Australasian and New Zealand Journal of Surgery. Sydney.  
Beiträge zur Klinik der Tuberkulose. Berlin.  
Bibliotek for læger. Copenhagen.  
Boletín de la Sociedad cubana de pediatria. Havana.  
Brain. London.  
British Heart Journal. London.  
British Journal of Children's Diseases. London.  
British Journal of Dermatology and Syphilis. London.  
British Journal of Experimental Pathology. London.  
British Journal of Ophthalmology. London.  
British Journal of Radiology. London.  
British Journal of Surgery. Bristol.  
British Journal of Tuberculosis. London.  
British Journal of Urology. London.  
British Medical Journal. London.  
Bulletin of Health Organization of League of Nations. Geneva.  
Bulletin of the Johns Hopkins Hospital. Baltimore.  
Bulletin of the Los Angeles Neurological Society.  
Bulletin of the Naval Medical Association. Tokyo.  
Bulletin of the New York Academy of Medicine. New York.  
California and Western Medicine. San Francisco.  
Canadian Medical Association Journal. Montreal.  
Canadian Public Health Journal. Toronto.  
Cancer Research. Philadelphia.  
Clinica ostetrica e ginecologica. Rome.  
Clinical Science. London.  
Connecticut State Medical Journal. Hartford.  
Delaware State Medical Journal. Wilmington.  
Deutsche medizinische Wochenschrift. Leipzig.  
Deutsche Zeitschrift für Chirurgie. Berlin.  
Difesa sociale. Rome.  
Edinburgh Medical Journal.  
Endocrinology. Los Angeles.  
Fortschritte der Therapie. Leipzig.  
Gann. Tokyo.  
Geburtshilfe und Frauenheilkunde. Leipzig.  
Giornale di clinica medica. Parma.  
Giornale della reale Accademia di medicina di Torino. Turin.  
Glasgow Medical Journal.  
Hospital. Rio de Janeiro.  
Illinois Medical Journal. Chicago.  
Indian Medical Gazette. Calcutta.  
Jahresbericht des Kurashiki-Zentralhospitals. Kurashiki.  
Journal of Allergy. St. Louis.  
Journal of the Arkansas Medical Society. Fort Smith.  
Journal of Bacteriology. Baltimore.  
Journal of Bone and Joint Surgery. Boston.  
Journal of Clinical Endocrinology. Springfield, Ill.  
Journal of Clinical Investigation. New York.  
Journal of Endocrinology. London.  
Journal of Experimental Medicine. New York.  
Journal of the Florida Medical Association. Jacksonville.  
Journal of Hygiene. London.  
Journal of Immunology. Baltimore.  
Journal of the Indiana State Medical Association. Indianapolis.  
Journal of Industrial Hygiene and Toxicology. Baltimore.  
Journal of Infectious Diseases. Chicago.  
Journal of Investigative Dermatology. Baltimore.  
Journal of the Iowa State Medical Society. Des Moines.  
Journal of the Kansas Medical Society. Topeka.  
Journal of Laboratory and Clinical Medicine. St. Louis.  
Journal-Lancet. Minneapolis.  
Journal of Laryngology and Otolaryngology. London.  
Journal of the Maine Medical Association. Portland.  
Journal of the Medical Association of the State of Alabama. Montgomery.  
Journal of the Medical Association of Georgia. Atlanta.  
Journal of the Medical Society of New Jersey. Trenton.  
Journal of Mental Science. London.  
Journal of the Michigan State Medical Society. Muskegon.  
Journal of the Missouri State Medical Association. St. Louis.  
Journal of the Mount Sinai Hospital. New York.  
Journal of Nervous and Mental Disease. New York.  
Journal of Neurology and Psychiatry. London.  
Journal of Neurophysiology. Springfield, Ill.  
Journal of Nutrition. Philadelphia.  
Journal of Obstetrics and Gynaecology of British Empire. Manchester.  
Journal of the Oklahoma State Medical Association. Oklahoma City.  
Journal of Pathology and Bacteriology. Edinburgh.  
Journal of Pediatrics. St. Louis.  
Journal of Pharmacology and Experimental Therapeutics. Baltimore.  
Journal of the Philippine Medical Association. Manila.  
Journal of Physiology. Cambridge.  
Journal of the South Carolina Medical Association. Greenville.  
Journal of the Tennessee State Medical Association. Nashville.  
Journal of Thoracic Surgery. St. Louis.  
Journal of Urology. Baltimore.  
Kekkaku. Tokyo.  
Kentucky Medical Journal. Bowling Green.  
Khirurgiya. Moscow.  
Kinderärztliche Praxis. Leipzig.  
Klinicheskaya meditsina. Moscow.  
Klinische Monatsblätter für Augenheilkunde. Stuttgart.  
Klinische Wochenschrift. Berlin.  
Lancet. London.  
Laryngoscope. St. Louis.  
Medical Annals of the District of Columbia. Washington.  
Medical Journal of Australia. Sydney.  
Medicina. Madrid.  
Medicina del lavoro. Milan.  
Medicina sperimentale. Archivio Italiano. Turin.  
Medicine. Baltimore.  
Medizinische Klinik. Berlin.  
Medizinische Welt. Berlin.

\*Cannot be lent.



- Military Surgeon. Washington, D. C.  
 Minnesota Medicine. St. Paul.  
 Mitteilungen aus der medizinischen Akademie zu Kyoto. Kyoto.  
 Monatsschrift für Geburtshilfe und Gynäkologie. Basel.  
 Monatsschrift für Kinderheilkunde. Berlin.  
 Monatsschrift für Ohrenheilkunde. Berlin.  
 Münchener medizinische Wochenschrift. Munich.  
 Nagasaki Igakkai Zasshi. Nagasaki.  
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 New Orleans Medical and Surgical Journal.  
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 Psychiatric Quarterly. Utica, N. Y.  
 Psychoanalytic Quarterly. Albany, N. Y.  
 Public Health Reports. Washington, D. C.  
 Quarterly Journal of Medicine. Oxford.  
 Quarterly Journal of Studies on Alcohol. New Haven, Conn.  
 Radiology. Syracuse, N. Y.  
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 Review of Gastroenterology. New York.  
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 Rhode Island Medical Journal. Providence.  
 Riforma medica. Naples.  
 Rinascenza medica. Naples.  
 Rocky Mountain Medical Journal. Denver.  
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 Western Journal of Surgery, Obstetrics and Gynecology. Portland, Ore.  
 West Virginia Medical Journal. Charleston.  
 Wiener klinische Wochenschrift. Vienna.  
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 Zeitschrift für Geburtshilfe und Gynäkologie. Stuttgart.  
 Zeitschrift für die gesamte Neurologie und Psychiatrie. Berlin.  
 Zeitschrift für Tuberkulose. Leipzig.  
 Zeitschrift für Urologie. Leipzig.

## SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "OS," Organization Section; "SS," Student Section; "ab," abstracts; the star (\*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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*Am.—American*  
*A.—Association*  
*Coll.—College*  
*Conf.—Conference*  
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*Conv.—Convention*  
*Dist.—District*  
*Hosp.—Hospital*  
*Internot.—International S.—Surgical*  
*M.—Medical*

*Med.—Medicine*  
*Not.—National*  
*Pharm.—Pharmaceutical*  
*Phys.—Physicians*  
*Rev.—Revision*  
*Ry.—Railway*  
*Soc.—Society*  
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